Renewal of the Nellis Air Force Range Land Withdrawal

Legislative Environmental Impact Statement

Volume 2

Comments, Responses, and Appendices

March 1999

RENEWAL OF THE NELLIS AIR FORCE RANGE LAND WITHDRAWAL

Department of the Air Force

Legislative Environmental Impact Statement

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NELLIS RANGE RENEWAL

VOLUME 2

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RENEWAL
OF THE NELLIS AIR FORCE RANGE
LAND WITHDRAWAL

LEGISLATIVE ENVIRONMENTAL IMPACT STATEMENT

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1.0 INTRODUCTION

This Technical Support Document (TSD) was developed primarily to provide detailed information on airspace use and aircraft operations (sorties) for describing baseline conditions and assessing each of the alternatives for the Nellis Air Force Range (NAFR) land withdrawal renewal LEIS. It is also intended to serve as a "living document" for consolidating and maintaining consistency of other quantitative data for analyses. It is important that the same data be used by all analysts for consistency and credibility in the LEIS. The TSD supplements information that has been described in Chapters 1.0 and 2.0 of Volume 1 of the LEIS.

The airspace/operational data in this document consolidates airspace/range descriptions, sortie data, mission descriptions, and other data contained in the Air Force Description of Proposed Action and Alternatives (DOPAA), AFI 13-212 (NAFR Range Description and Capabilities), and other sources provided by Nellis AFB. This data should provide most of the operational detail needed to develop and model analyses for noise, air quality, flight safety, and airspace use.

1.1 DESCRIPTION OF BASELINE AND ALTERNATIVES

1.1.1 Baseline

The baseline for the TSD reflects the current use of withdrawn lands and associated special use airspace required to support ongoing tactical training operations conducted on NAFR. A wide spectrum of training capabilities, including scorable bombing and gunnery ranges, air-to-air ranges, and simulated electronic combat threat emitters, are available on NAFR to provide a realistic combat training environment. The special use airspace (military operations areas [MOAs] and restricted areas) also provides an ideal environment for air-to-air combat tactics and the Air Combat Maneuvering Instrumentation (ACMI) arena that provides real-time monitoring of these training activities. Training missions accomplished include air-to-air, tactical air-to-ground weapons delivery, ground based threat countermeasures, and conventional weapons delivery. Test and evaluation of tactics and weapons systems in a safe and secure environment dependent on NAFR.

1.1.2 Alternatives 1A & 1B — Indefinite Withdrawal

As described in Chapter 2.0 of the LEIS, Alternatives 1A and 1B address the renewed withdrawal of currently withdrawn lands for an indefinite period with periodic reports to Congress regarding the need for the lands and stewardship and informational programs. None of the action alternatives would involve any modifications to the existing airspace configuration or use. The current level of military activity on the NAFR is proposed to remain approximately the same for the future anticipating no significant change to current national policy. Some proposed changes to missions and aircraft are anticipated. The F-111 and EF-111 are scheduled to leave the Air Force inventory before this land renewal would take effect in the year 2001. It is expected that the F-22 and other not-yet-defined weapons systems may begin

using the NAFR prior to this land use renewal and would continue for the foreseeable future. Proposed F-22 testing, evaluation, and weapons school operations at NAFR will be assessed in a separate study. Other environmental mission changes include the addition of an Unmanned Aerial Vehicle Squadron at Indian Springs Air Force Auxiliary Field (ISAFAF) and a new test mission to be performed by the Defense Threat Reduction Agency.

1.1.3 Alternatives 2A & 2B

Alternatives 2A and 2B are the same as Alternatives 1A and 1B except that the withdrawal period would be 25 years rather than indefinite. This alternative also has no airspace or operational changes associated with either Scenario A or B.

1.1.4 No-Action Alternative

The No-Action Alternative entails not renewing the current NAFR withdrawn lands; therefore management of these lands would be turned over to appropriate public land management agencies. The military could no longer deliver any type of ordnance or operate ground facilities on the former withdrawn lands. The airspace over the formerly withdrawn NAFR would still exist. This airspace would be expected to be changed to a minimum altitude of 100 feet above ground level (AGL) to remain as restricted airspace or revert to MOAs, as coordinated with and agreed upon by the FAA. MOA airspace would not offer the same level of safety as restricted airspace.

NAFR closure would be expected to result in immediate reductions in aircraft activity and facilities operations. Uncontaminated lands would be returned to the BLM for administration and multiple use. Target sites and other ground facilities (including major facilities at Tonopah Test Range (TTR), Tolicha Peak EC Range (TPECR), and ISAFAF and smaller facilities throughout NAFR) would be returned following appropriate actions for national security and decontamination to meet applicable standards and regulatory schedules.

For the purposes of the LEIS, an activity reduction scenario has been prepared. This scenario would reduce the staffing of Nellis AFB and activities over what was NAFR by approximately 50 percent. Detailed reductions in force assumptions (by Air Force Unit) are presented in Appendix A.8.

1.2 SORTIE DEFINITION/ASSUMPTIONS

Sortie information contained in this document was provided by Nellis AFB and extracted from the NAFR Utilization Report database. In this database a “range sortie” or “sortie-operation” is counted each time an aircraft flies in or through a numbered range, electronic combat range, or military operations area. As an example, an F-16 taking off from Nellis AFB on a Red Flag flight will typically fly through 10 to 12 different airspace / range subsections before returning to land at the base. For large composite forces flying on the NAFR, the daily schedule reserves the airspace for one aircraft because it is not known until a day prior how many aircraft will be participating in the exercise package. Range Operations is informed of this number of aircraft

on the day of the occurrence. This number of aircraft then represents the number taking off from Nellis AFB and is used to estimate range sorties or sortie-operations.

Day sorties are from 6:00 A.M. to 10:00 P.M. Night sorties are those that occur after 10:00 P.M. Few night sorties are flown on the NAFR Nellis AFB due to noise abatement procedures. "Night" Red Flags are expected to be completed by 10:00 P.M.

1.3 DOCUMENT ORGANIZATION

Chapter 2.0 describes all airspace / range elements and operations associated with NAFR mission activities. Chapter 3.0 describes the types of flight missions conducted. Appendices contain all the sortie data, specific aircraft mission descriptions, munitions use, and other data provided by the Air Force.

2.0 NELLIS AIR FORCE RANGE (NAFR) AIRSPACE AND RANGE DESCRIPTIONS

This Chapter describes the different types of airspace and most common transition corridors established for the NAFR to protect flight operations and land-based activities associated with Air Force test and training mission requirements. Also described are other airspace areas associated with NAFR flight operations, to include the Low Altitude Tactical Navigation (LATN) areas, the ISAFAF Class D airspace, and the Las Vegas Class B airspace. Published avoidance areas for towns, residences, farms, mines, wildlife management areas, etc. are also listed in Appendix A.7.

2.1 NAFR AND NEVADA TEST SITE (NTS) AIRSPACE

The NAFR Complex is composed of the Desert and Reveille MOAs with overlying Air Traffic Control Assigned Airspace (ATCAA) and five restricted areas: R-4806E, R-4806W, R-4807A, R-4807B, and R-4809 (not including R-4809A) as shown in Figure 2-1. The NTS, operated by the Department of Energy (DOE) and located southwest of and adjacent to the NAFR, is protected by restricted areas R-4808N and R-4808S. The TTR, operated by Sandia National Laboratories for the DOE is protected by restricted area R-4809A. The Defense Mapping Agency Nellis AFB Range Chart NRCXX01, Edition 4, dated 9/95 provides more specific detail in correlating designated airspace areas to withdrawn land topography and uses. Each airspace area/subsection and their uses as they relate to NAFR operations are described in more detail below. Sortie data for each range subarea and flight profile information for each aircraft type using the NAFR are provided in Appendix A.1.

2.1.1 Military Operations Areas (MOAs)

By definition, a MOA is airspace established to separate or segregate certain nonhazardous military activities from instrument flight rules air traffic and to identify for visual flight rules traffic where these activities are conducted. The Desert and Reveille MOAs are used for conducting air-to-air intercept training which consists of high speed operations, abrupt maneuvers, and supersonic flight at and above 5,000 feet AGL. The base of the MOAs is 100 feet AGL. Since the ceiling MOA altitude is limited by federal ruling up to, but not including, 18,000 feet above mean sea level (MSL), ATCAA is provided on an as needed basis by the FAA to extend airspace from 18,000 feet MSL to the higher altitudes needed to accommodate the flight training requirements. ATCAAs are only activated for use while scheduled aircraft operations are being conducted within the higher altitudes above the MOAs. Specific information for each MOA and associated subsection follows:

- **Reveille MOA**. This airspace comprises the northern portion of the NAFR and is normally controlled by the Federal Aviation Administration's (FAA) Salt Lake Air Route Traffic

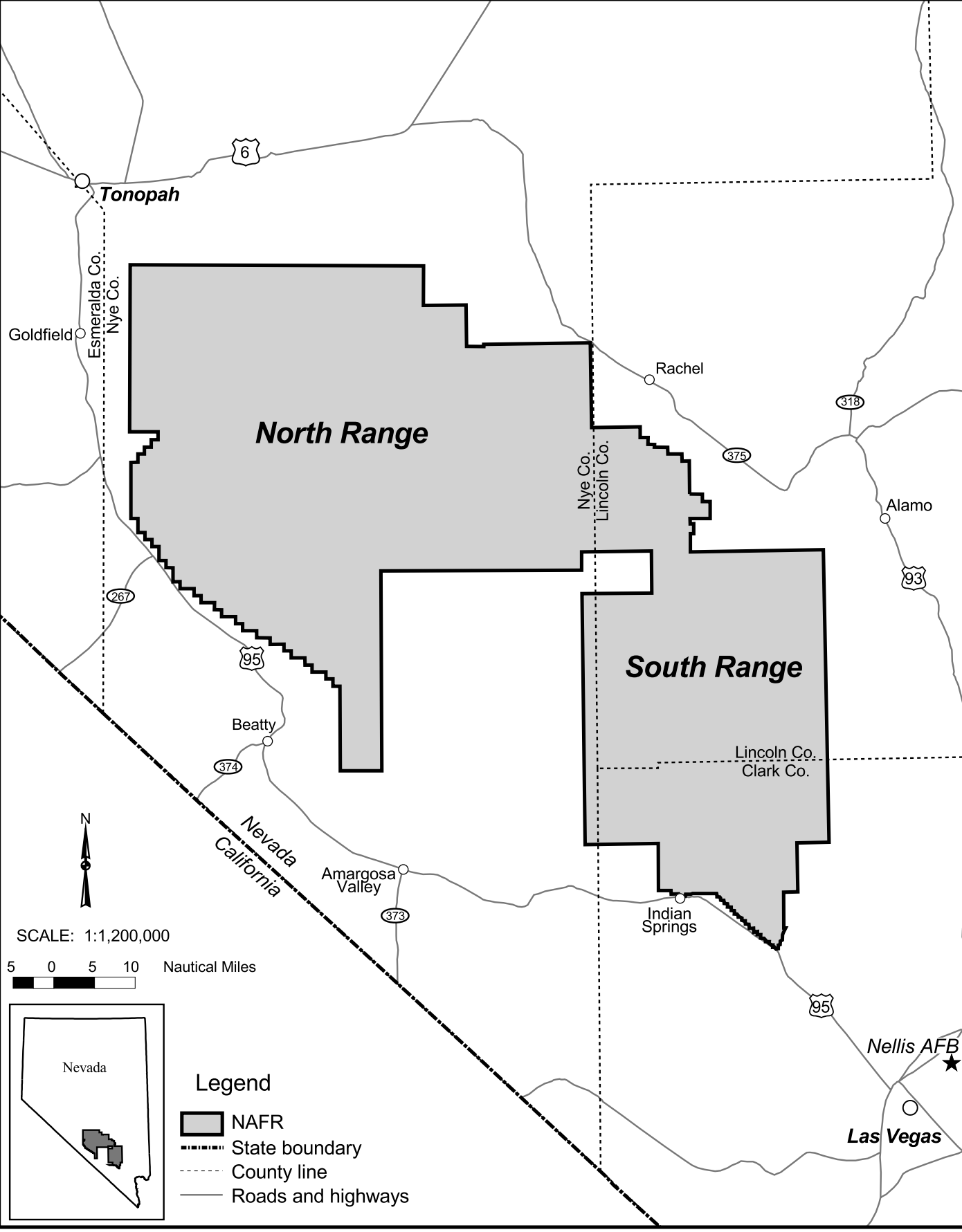

Figure 2-1. Lands Contained within Alternatives 1A and 2A

Control Center (ARTCC). Since a jet route used for east-west transit of civil air traffic is situated within the Reveille MOA, Nellis must schedule use of this airspace in advance.

- **Desert MOA**. The Desert MOA comprises the eastern half of the NRC and is active daylight hours Monday through Saturday and by Notice to Airmen (NOTAM) during other hours. It is divided into five subsections: Alamo (Alpha, Charlie, and Bravo), Elgin, Caliente (East and West), Coyote (Alpha, Bravo, and Charlie), and the Sally Corridor. With the exception of the Sally Corridor, these MOA subsections begin at 100 feet AGL.

  - *Alamo (Alpha, Bravo and Charlie).* This section is an air-to-air training area. (These subsections are the same as restricted area R-4806E and become part of the Desert MOA when hazardous activities are not scheduled for R-4806E). R-4806E is published as active from 0500-2000 hours (0600-2100 DT) Monday through Saturday or as otherwise issued by a NOTAM. Alamo is entered / exited from the Sally Corridor.

  - *Elgin*. This section is the primary air-to-air training area and contains the ACMI range. Aircrews normally enter / exit this area via the Sally Corridor.

  - *Caliente (East and West).* Also an air-to-air training area, Caliente is normally scheduled as a whole but can be divided into the east and west subsections. Aircrews will normally enter / exit Caliente West via the north end of the Sally Corridor and Caliente East via designated Military Training Routes (MTR) or along a line running from the north end of the Sally Corridor to the southwestern corner of Caliente West.

  - *Coyote (Alpha, Bravo, and Charlie).* Coyote provides airspace for tactical training maneuvers while en route to R-4807 (70 series ranges and electronic combat ranges).

  - *Sally Corridor*. The Sally Corridor is the transition route between Nellis AFB and portions of the Nellis Range Complex (NRC). This corridor begins at 9,700 feet MSL.

2.1.2 Restricted Areas and Range Subsections

By definition, a restricted area is airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction during scheduled periods when hazardous activities are being performed. Restricted airspace may be designated as joint use, whereas non-participating civil or military aircraft may be routed through this airspace by air traffic control when activities are not scheduled. Some restricted areas are not designated for joint use, therefore use by non-participating aircraft is normally not permitted at any time. Within NAFR / NTS complex, restricted areas R-4806 and R-4807 are joint use which means that non-participating aircraft may be cleared through these areas by air traffic control when they are not in use; R-4808 and R-4809 are not joint use due to the continuous nature of hazardous activities, therefore, they are always unavailable to non-participating aircraft. Specific descriptions of each restricted area and their subsections follow:

- **Class A.** A Class A range is staffed, has a scoring capability from the ground, and has a (certified) Range Control Officer (RCO) on the ground who controls aircraft using the range.

- **Class B.** A Class B range is either staffed or unstaffed, has a scoring capability from the ground, but does not have a RCO on the ground controlling aircraft. The flight lead, forward air controller (FAC), or other person, as briefed, will have RCO responsibilities.

- **Class C.** A Class C range is not staffed, and has no scoring or aircraft control from the ground. The RCO function may be performed by the flight lead, FAC, or other person as briefed.

- **R-4806 (R-4806E and R-4806W)**. R-4806E becomes restricted airspace when Alamo Alpha, Bravo, and Charlie are not used as part of the Desert MOA. Targets are located within the central portion (Alamo Bravo) of R-4806E. R-4806W is divided into 11 different subsections (61, 62B & C, 63 & 63A, 64A-D, and 65N & S) that are used for conventional bombing and gunnery testing and training as specified below.

  - *Range 61*. This unmanned range contains one anti-personnel interdiction target utilized by helicopters. Part of the Dart East air-to-air gunnery range is located within R-61.

  - *Range 62B/C*. These ranges contain targets primarily in and around the Dogbone Lake that consist of an airfield, bomb circles, supply area, convoys, and AAA / SAM sites. All targets are TOSS scorable except for a Cluster Bomb Unit target. Portions of the Dart East and South air-to-air gunnery ranges are located within R-62.

  - *Ranges 63/63A and 65N/S*. These are manned bombing ranges that contain numerous scorable targets. Ranges 63 / 63A are used primarily for Operational Test and Evaluation missions and night conventional weapons training and as a backup day conventional weapons delivery range. They can accommodate live or inert or conventional training air-to-ground deliveries with Televised Optical Scanning System (TOSS) scoring and Kineto Tracking Mounts. These ranges are also used for small arms live-fire training. On the northern border of R-63 extending into the southern border of R-62 is the manned communications threat site (63BB). Ranges 65N / S are used primarily for day conventional weapons delivery training. Several tactical targets are included. Portions of the Dart West and Dart South air-to-air gunnery ranges are located within R-65.

  - *Ranges 64A/B/C/D*. R-64A and D are used primarily as training areas for helicopter operations and transition area for aircraft going into R-65. No ordinance is authorized in R-64A. R-64B / C contain tactical targets such as tanks, convoys, and simulated AAA / missile sites. Portions of the Dart West and South air-to-air gunnery ranges are located within R-64.

  - Except for the extreme northern portion of this restricted area, all of R-4806E / W lies within the Desert National Wildlife Range (DNWR). For that reason, aircraft are to remain above 2,000 feet AGL unless mission accomplishment requires lower altitudes

and air-to-air gunnery operations are conducted above 10,000 feet MSL. Also, there is an 8,000 feet MSL restriction within 2 nautical miles (NM) of the U.S. Fish and Wildlife Corn Creek Station, which is located in the southeast corner of R-63.

- **R-4807 (R-4807A and R-4807B)**. R-4807A is subdivided into several subsections that include 71N / S, 74A / B / C, 75E / W, 76 / 76A, Electronic Combat (EC) South, TPECR, the Tonopah EC Range (TECR) which is made up of EC East and EC West, and the Cactus EC Range (not depicted on map). R-4807B is subdivided into Pahute Alpha and Pahute Bravo. These subranges are described in more detail as follows:

  - *Ranges 71N/S*. These unmanned ranges are Class B for TOSS scored targets and Class C for all others.

  - *Ranges 74A/B/C*. R-74A contains no targets; R-74B / C contain numerous tactical targets that include a simulated oil field, bomb circles, tank convoys, an airfield, industrial complex, tank company / elements, munitions storage,, missiles sites, regimental / battery headquarters, etc. No TOSS is available on R-74.

  - *Range 75E/W*. R-75E / W is Class B for TOSS scored targets and Class C for all other targets. R-75W consists of missile sites, convoys, signal platoons, air defense artillery units, infrared targets, and other target arrays.

  - *Range 76/76A*. R-76 / 76A is a Class B range for TOSS scored targets and a Class C for all other targets. Target arrays consist of airfields, missile sites, industrial areas, a railroad complex, convoys, command and control centers, and tank arrays designed for infrared training. Live ordnance is allowed on some targets; inert training ordnance is allowed on all targets. Two areas, FAC Alpha and FAC Bravo, located within R76 are designated ground party safety zones when scheduled for use. Manned threat emitters are sometimes located in these zones.

  - *TPECR*. This is a manned electronic combat threat simulator range. There are no bombable targets on this range and no ordnance is expended on the TPECR.

  - *TECR (EC East and EC West)*. TECR is a manned electronic combat threat simulator range containing no bombable targets. Aircrews are prohibited from expending ordnance anywhere within the TECR complex. Note: EC West is that portion of R-4809 that excludes R-4809A.

  - *EC South*. EC South is divided into eastern (Alpha) and western (Bravo) areas and is a manned electronic combat threat simulator range containing no bombable targets. Aircrews are prohibited from expending ordnance anywhere within EC South. Note: EC South Alpha extends from the surface to 13,000 feet MSL to allow an overlying corridor (Caesar Corridor) above 14,000 feet MSL to transition aircraft from the northern ranges for recovery to Nellis AFB.

- *Cactus EC Range.* This is a small manned electronic combat range located in the east side of R-71. Cactus EC Range is an extension of EC West.

- *R-4807B (Pahute Mesa).* R-4807B land area is used by the DOE as an annex to the NTS and the Air Force uses the airspace for overflights.

- **R-4808 (R-4808N/S/E/W).** R-4808 is controlled by the DOE for NTS activities. R-4808S is used jointly by the NTS, Nellis AFB, and the FAA Los Angeles ARTCC to accommodate DOE activities and permit aircraft to overfly the southwest corner of R-4808. R-4808N is divided into R-4808 E and R-4808W for air traffic purposes. R-4808E is not used for NAFR flight training operations and any overflight is restricted to emergency aircraft and other DOE approved missions subject to restrictions. R-4808W is used for limited overflight of NAFR aircraft while following locally published departure and recovery routes. Altitude restrictions apply over DOE activities associated with the Yucca Mountain Site Characterization Project within this restricted area.

- **R-4809 (R-4809A and R-4809B)**. Portions of R-4809 are established for joint use by the DOE and Air Force. R-4809A extends from the surface to unlimited and is not available to NAFR users; however, the TTR Airfield, located within R-4809A can be used as a divert base for in-flight emergencies. Other portions of R-4809, including R-4809B comprise EC West, an electronic combat range discussed above.

2.1.3 Supersonic Training Area

Supersonic flight is approved within the Desert MOA, ATCAAs, and R-4806E from 5,000 feet AGL to infinity except for the restrictions in Appendix A.7 from AFI 13-212, Vol 2, Nellis AFB Supplement 1.

2.2 NAFR SUPPORTING AIRSPACE AREAS

Several airspace areas, such as LATN areas, MTRs, and air refueling tracks, are established within or adjacent to the NAFR to support flight training operations, as described in this section.

2.2.1 Low Altitude Training Navigation (LATN) Areas

LATNs are unrestricted airspace areas established on the east and west sides of the NAFR for A-10s to practice random selection of navigation points and low altitude tactical formations between 100 and 1,500 feet AGL. These areas are normally used when no airspace is available for this type of training within the NAFR complex. While operating in these areas, aircraft must remain clear of residential, populated, and noise sensitive areas. LATNs are not depicted on aeronautical charts however local airports and aviation groups have been advised of their existence and associated operations.

2.2.2 Military Training Routes (MTRs)

Twenty-one different MTRs are located adjacent to or within the NAFR Airspace Complex. These routes permit operations at airspeeds in excess of 250 knots while providing training in low altitude tactics and navigation. MTRs are established as instrument routes (IRs) or visual routes (VRs). Five of these routes enter restricted air space within the NAFR or terminate at the NAFR boundary. Some of the 21 routes may be used when ingressing/egressing NAFR range target areas, during both routine training and exercise. The various alternatives addressed in the LEIS would not be expected to result in the establishment or elimination of any of the MTRs near the NAFR. It is assumed that the No Action Alternative would result in a 50 percent reduction in use of four the MTRs that enter or abut the NAFR. Specific locations, altitude information, and operational restrictions for each route can be found in the DOD Flight Information Publication Area Planning AP/1B (Appendix A.2) and associated Chart for the Western United States. A table showing currently available sortie and operational data for each MTR is also included in Appendix A.2. Most of these MTRs were excluded from detailed project-specific analysis because they are not used in conjunction with NAFR and would not be modified under the No Action Alternative.

2.2.3 Air Refueling (AR) Routes

ARs consist of rectangular blocks of airspace that are used to refuel aircraft. Those ARs within or immediately adjacent to the NAFR complex used to sustain aircraft operations during training activities/exercises are as follows:

- **AR-625**. Located adjacent to the northwest corner of the NAFR complex; has low (FL180-210) and high (FL230-250) tracks that may be used simultaneously.

- **AR-641A**. Located within Caliente and Cedar portion of the Desert MOA and ATCAA; published altitudes are 12,000 MSL-FL230.

- **AR-641B**. Located in Caliente, Cedar, Reveille ATCAAs and Salt Lake City ARTCC Class A airspace adjacent to and within the northeast corner of the NAFR complex; published altitudes are FL190-FL230.

Two other ARs, AR-624 and AR-635 located, respectively, 50 NM southeast and 25 NM north of the NAFR complex, also support NAFR operations, as necessary.

2.3 AIRPORT, TRANSITIONAL, & AVOIDANCE AIRSPACE AREAS

Airspace areas are established around airfields and, in some cases, along transition routes to help identify areas of high density aircraft operations and to protect all military and civil aircraft operating within these areas. Additionally, some flight restrictions are imposed locally around land use areas that may be adversely affected by low level aircraft operations. The following sections describe each of these areas as they relate to Nellis AFB and NAFR aircraft operations.

2.3.1 Indian Springs Air Force Auxiliary Field (ISAFAF)

ISAFAF, located on the southern boundary of R-65S, provides basing for unmanned aerial vehicle (UAV) operations, aircraft staging support, and emergency / divert recovery for NAFR operations. It is also the primary training location for the Thunderbirds Air Demonstration Squadron. The Indian Springs control tower provides air traffic control services within this area any time NAFR or ISAFAF has flying operations scheduled for the local area. Aircraft operational data for ISAFAF is contained in Appendix A.1.

2.3.2 Tonopah Test Range (TTR) Airfield

The TTR Airfield is located within R-4809A and is available to NAFR aircraft operations for emergency landings only. Operational data for Tonopah is contained in Appendix A.1.

2.3.3 Nellis AFB

Nellis AFB and McCarran International Airport are surrounded by the Las Vegas airspace, which is a class of airspace that is characteristic of any airport environment having a high volume of air traffic. This irregular shaped airspace extends from 20-25 nautical miles (NM) south and east of Las Vegas / Nellis AFB to the southern boundary of the Desert MOA (Sally Corridor). All aircraft entering or transiting through this charted airspace must be in contact with and under the positive control of either the Nellis or McCarran radar approach control facilities, depending on their point of entry. The positive, protective nature of this airspace enhances flight safety for military aircraft operating between Nellis AFB and the NAFR, as well as civil aviation transiting through this high air traffic density area. Aircraft operational data for Nellis AFB is contained in Appendix A.1.

2.3.4 Alert Area A-481

An Alert Area is, by definition, an area established and charted on aeronautical maps to inform pilots of a specific area wherein a high volume of pilot training or an unusual type of aeronautical activity is conducted. Alert Area A-481 is established from Nellis AFB westward to alert civil aviation of high-density military aircraft operations transiting between the base and the western portion of the NAFR. A-481 begins at 7,000 feet MSL and extends to a ceiling of 17,000 feet MSL.

2.3.5 Range Transition Corridors

Two corridors are used primarily to transition aircraft between Nellis AFB and the NAFR. As discussed in section 2.1.1, the Sally Corridor portion of the Desert MOA is used for transit to and from the Desert and Reveille MOAs and the 60 and 70 series ranges. The Lee Corridor, which runs south of the NAFR between Nellis AFB and entry / exit points of R-4808S and R-4807, can also be used for transition to and from the 60 and 70 series ranges.

2.3.6 Low-Level Avoidance and Noise Sensitive Areas

Low-level avoidance and noise sensitive areas have been identified for various locations within and around the NAFR. These locations must be avoided by established horizontal and vertical distances for flight safety, noise sensitivity, and environmental sensitivity. A list of low-level avoidance and noise sensitive areas for the NAFR area, as published in AFI-250 (NAFB supplement) are contained in Appendix A.7. Temporary flight restrictions are also occasionally established within NAFR, such as for periods when the Bureau of Land Management (BLM) is conducting fire fighting activities.

3.0 CURRENT NELLIS AIR FORCE RANGE MISSIONS

This chapter describes the different types of missions currently conducted on the NAFR, those portions of the NAFR airspace used to conduct these missions, and the standard routes normally flown during these missions when transiting between Nellis AFB and the NAFR. Detailed descriptions of each aircraft mission are provided in Appendix A.3.

3.1 TRAINING MISSION DESCRIPTIONS

3.1.1 Aircraft/Organization Missions

Flying training at NAFR includes these basic levels of training: upgrade, requalification, continuation, weapons instructor, and composite force. Mission profiles describe how flights are conducted and are denoted by the types of training missions to be accomplished as follows: air-to-air training, tactical air-to-ground weapons delivery training, ground based threat countermeasures training, and conventional weapons delivery training. The four general airspace areas that support these training missions on the NAFR are the MOAs, 70 series ranges (R-4807), Electronic Combat Ranges, and the 60 series ranges (R-4806). Table 3.1 summarizes (1) the types of flying training missions normally conducted on the NAFR by the different aircraft types assigned to Nellis AFB and (2) those airspace / range areas where these missions are conducted, and the average amount of time (minutes) in the airspace. Specific details of each mission type is included in Appendix A.2. These missions also generally reflect those performed by transient aircraft conducting non-Flag training on the NAFR.

Missions currently performed by other organizations at Nellis AFB include the following:

Air Force Air Demonstration Squadron — Practices conducted at ISAFAF within R-65 and occasionally at Nellis AFB.

11th and 15th Reconnaissance Squadrons — UAVs will operate primarily in R-63, R-64, and R-65. Other ranges may be used for target acquisition practice.

Sandia National Laboratories — Test operations in the TTR (R-4809A).

Desert Warfare Training Center — Silver Flag Alpha small arms live fire and tactics in portion of R-63.

Table 3.1 Aircraft Missions and Airspace Performed (page 1 of 2)

Aircraft	Type of Mission	Airspace Used (Avg. Time-Min.)
F-15C	Aircraft Handling Characteristics	MOAs (30)
	Basic Fighter Maneuvers	MOAs (30)
	Air Combat Maneuvers	MOAs, or 60 series and Alamo (30)
	Step down training	MOAs or Alamo and 60 series, or 70 series and ECRs (50)
	Tactical Intercepts	MOAs, 70 series and ECRs (45)
	Night	70 series, ECRs, and MOAs (30)
	Dissimilar Air Combat Tactics	MOAs and 70 series (45)
	Mission Employment	MOAs, 70 series, and ECRs (90)
F-15E	Advanced Handling Characteristics	MOAs (45)
	Basic Fighter Maneuvers	MOAs ((30)
	Tactical Intercepts	MOAs and 70 series (60)
	Air Combat Maneuvering / Tactics	MOAs, 70 series, and ECRs (45)
	Surface Attack	60 or 70 series (60)
	Surface Attack Tactics	70 series and ECRs (45)
	Weapons	60 or 70 series (45)
	Mission Employment	MOAs, 70 series, ECRs (20)
F-16	Advanced Handling Characteristics	60 series and MOAs (30)
	Basic Fighter Maneuvers	MOAs (30)
	Tactical Intercepts / Air Combat Maneuvering	MOAs (45)
	Air Combat Tactics	MOAs (40)
	Surface Attack	60 series or 70 series and ECRs (40)
	Surface Attack Tactics	60 series or 70 series and ECRs (40)
	Close Air Support	60 series (40)
	Weapons	70 series (40)
	Night	60 or 70 series (40)
	Mission Employment	70 series and ECRs (40)
A / OA-10	Advanced Handling Characteristics	Alamo, 60 series (60-90)
	Basic Fighter Maneuver	Alamo, 60 series (60-90)
	Surface Attack	60 series, 70 series, ECRs (60-90)
	Weapons Employment	60 series or 70 series and ECRs (60-75)
	Combat Search and Rescue	60 series, 70 series, ECRs (60-90)
	Night	60 series (60-120)
	Dissimilar Air Combat Tactics / Defensive Low Altitude Air-to-Air Training	MOAs or 60 series (60-75)
	Mission Employment	MOAs, 70 series and ECRs (10-15)

Table 3.1 Aircraft Missions and Airspace Performed (page 2 of 2)

Aircraft	Type of Mission	Airspace Used (Avg. Time-Min.)
F-16C 414 CTS	Local Area Orientation	70 series, MOAs (30)
	Single Air Combat	MOAs (30)
	Element Air Combat	MOAs (30)
	Low Altitude Step Down Training	MOAs (30)
	Element Combat Tactics	MOAs (30)
422 Test & Eval F-15C, F-15E, F-16C, A-10, HH-60	Same mission types as shown for same aircraft in this table.	Same airspace as shown for mission types in this table.
USAFWS HH-60G	Day / Night Familiarization	60 series and Indian Springs (90)
	Navigation Systems Operations	60 series (90)
	Basic Helicopter Maneuvers	60 series (90)
	Defensive Maneuvering, Ground	70 series (90)
	Defensive Maneuvering, Air	60 series, MOAs (120)
	Combat Search and Rescue Task Force Scenario	60 series and Alamo (90)
	Mission Employment	70 series and ECRs (150)
66 Rescue HH-60G	Air-to Ground	60 series (60-90)
	Electronic Combat	70 series and ECRs (150)
	Low-level Navigation Training	MOAs (120)
	Air Refueling Training	Mormon Mesa AR Track (120)

3.1.2 Composite Force Training (Flag Exercises)

Flag exercises bring together all of the mission tasks and orchestrate a simulated combat scenario that employs and integrates all the capabilities of each mission element. Scenarios vary with each exercise to test and train the different tactics that can be used against adversary offensive and defensive forces. Generally the same range airspace elements are used for Flags which include the Desert and Reveille MOAs, overlying ATCAAs, 70 series ranges, electronic combat ranges, MTRs, and AR tracks. Although some Flags are conducted in the evening, they are normally completed prior to 10:00 P.M. for noise abatement at NAFB.

3.2 Flight Profiles

Flight profiles describe the routes most commonly flown between Nellis AFB and different portions of the NAFR complex, as follows:

Weapons delivery and threat countermeasures training (70 series and ECRs). The two most common routes available are (1) depart Nellis AFB to the west flying a canned instrument route that transits the Lee Corridor, and enters EC South from the southwest and (2) depart Nellis AFB to the north flying a canned route through the Sally Corridor and Coyote MOAs, entering EC East/R-74 from the east. After passing through the Sally Corridor, aircraft may fly one of the MTRs that transits the Desert MOA and enters the ECR/70 series ranges from the east. MTRs may also be flown from the departure to the west that enter the R-71 or R-76 ranges from the western side of the NAFR.

Air-to-air training. Aircraft normally depart Nellis AFB to the north, transit the Sally Corridor, and enter the assigned portion of the Desert MOA.

Flag exercises and USAF Weapons School Mission Employment phases. The majority of exercise offensive aircraft depart Nellis AFB to the north through the Sally Corridor and hold or refuel, as necessary, within Caliente/Cedar airspace (remaining east of the 115 degree longitude) while marshaling the Red Flag offensive aircraft package. This package may include aircraft from other bases that have entered the NAFR from the east and refueled, as necessary. Following marshaling, the package ingresses west to the target areas within the 70 series/EC ranges. Adversary aircraft (defensive forces) fly the Nellis AFB western departure route and enter the 70 series/EC ranges from the west.

3.3 OTHER NAFR USE DATA

Appendices A.4, A.5, and A.6 contain information on munitions use, Silver Flag Alpha use, and ground activity.

APPENDIX A.1

AIRCRAFT

FLIGHT PROFILE INFORMATION

APPENDIX A.1

FLIGHT PROFILE INFORMATION

The following data sheets, Table A.1-1, include detailed information describing the profiles of aircraft flown at NRC. Twenty different types of aircraft are included. Each numbered range and MOA were broken into six different altitude bands and then pilots were interviewed to gather their estimates of the time, speed, altitude, and power settings used while on a typical mission. The data for F-15C and F-15E are shown for each model but in the tables reflecting levels of sortie operations only generic F-15 sortie data are provided. A 50:50 split for these sorties should be used when correlating sorties to altitude and speed. Helicopter data shown reflect H-60 information only.

Table A.1-2, covers ISAFAF flying activities, including aircraft located at Indian Springs, aircraft having an in-flight emergency (IFE), aircraft landing because of low fuel, or aircraft diverted from Nellis AFB for various reasons. Normal flying data was available from 1990 to 1995 but IFEs and diverts were only available from 1991 to 1995.

UAVs will be flown from ISAFAF for the foreseeable future. Sortie predictions would be as described in the 11th Reconnaissance Squadron Activation Environmental Assessment.

The total numbers of IFEs and diverts indicates the number of aircraft that could have been potentially lost if ISAFAF had not been available. Obviously, other alternative airfields do exist which would be available to recover aircraft experiencing an emergency. However, some aircraft can be counted as "saved" because ISAFAF was the nearest suitable field and the aircraft would not have made it any farther.

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	R61 100-300	R61 300-500	R61 500-1K	R61 1K-5K	R61 5K-20K	R61 20K-50K	R62 100-300	R62 300-500	R62 500-1K	R62 1K-5K	R62 5K-20K	R62 20K-50K	R63 100-300	R63 300-500	R63 500-1K	R63 1K-5K	R63 5K-20K	R63 20K-50K	R64 100-300
AV-8																			
Time (Min)	1	1	2	1	10		1	1	2	1	10						10		1
Power (RPM)	93	93	93	97	75		93	93	93	97	75						75		93
Normal Speed (TAS)	480	480	470	450	300		480	480	470	450	300						300		480
A-10																			
Time (Min)	1	1			1		3	3	3	3	8		1	1					3
Power (RPM)	90	90			90		90	90	90	90	90		90	90					90
Normal Speed (TAS)	300	300			300		300	300	300	300	275		300	300					300
B-1																			
Time (Min)															10	10			
Power (RPM)															95	90			
Normal Speed (TAS)															550	500			
Supersonic Speed/Time																			
B-2																			
Time (Min)				5						8									
Power (RPM)				88						88									
Normal Speed (TAS)				420						420									
B-52																			
Time (Min)		5						15						15					
Power (RPM)		92						92						92					
Normal Speed (TAS)		380						380						380					
C-130																			
Time (Min)		5						10						10					
Power (% of Torque)		75						75						75					
Normal Speed (TAS)		250						250						250					
F-14																			
Time (Min)					2						4						4		
Power (RPM)					90						90						90		
Normal Speed (TAS)					480						480						480		
Supersonic Speed/Time																			
F-15C																			
Time (Min)		1	1	1	5	5		1	1	1	5	5		1	1	1	5	5	
Power (RPM)		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB	
Normal Speed (TAS)		480	480	480	480	480		480	480	480	480	480		480	480	480	480	480	
Supersonic Speed/Time					700/2	700/2					700/2	700/2					700/2	700/2	
F-15C																			
Time (Min)		1	1	1	5	5		1	1	1	5	5		1	1	1	5	5	
Power (RPM)		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB	
Normal Speed (TAS)		480	480	480	480	480		480	480	480	480	480		480	480	480	480	480	
Supersonic Speed/Time					700/2	700/2					700/2	700/2					700/2	700/2	

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	R61 100-300	R61 300-500	R61 500-1K	R61 1K-5K	R61 5K-20K	R61 20K-50K	R62 100-300	R62 300-500	R62 500-1K	R62 1K-5K	R62 5K-20K	R62 20K-50K	R63 100-300	R63 300-500	R63 500-1K	R63 1K-5K	R63 5K-20K	R63q 20K-50K	R64 100-300
F-15E																			
Time (Min)	2	2	2	1	5	5	2	2	2	1	5	5	2	2	2	1	5	5	2
Power (RPM)	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Normal Speed (TAS)	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
Supersonic Speed/Time																			
F-16																			
Time (Min)		1	1	1	5	5		1	1	1	5	5		1	1	1	5	5	
Power (RPM)		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB	
Normal Speed (TAS)		480	480	480	480	480		480	480	480	480	480		480	480	480	480	480	
Supersonic Speed/Time					700/2	700/2					700/2	700/2					700/2	700/2	
F-18																			
Time (Min)		1	1	1	5	5		1	1	1	5	5		1	1	1	5	5	
Power (RPM)		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB		95	95	95	95+AB	95+AB	
Normal Speed (TAS)		480	480	480	480	480		480	480	480	480	480		480	480	480	480	480	
Supersonic Speed/Time					700/2	700/2					700/2	700/2					700/2	700/2	
F-111																			
Time (Min)			1	1	1		1	2	3	3			1	1	2	2			2
Power (RPM)			100	100	95		100	100	100	100			100	100	100	100			100
Normal Speed (TAS)			540	540	480		540	540	540	540			540	540	540	540			540
Supersonic Speed/Time																			
F-117																			
Time (Min)					10					5	10					5	10		
Power (RPM)					90					90	94					90	94		
Normal Speed (TAS)					480					500	500					500	500		
TORNADO																			
Time (Min)	2	2	2		2		2	2	2		2		2	2	2		2		2
Power (RPM)	90	90	90		90		90	90	90		90		90	90	90		90		90
Normal Speed (TAS)	450	450	450		450		450	450	450		450		450	450	450		450		450
Supersonic Speed/Time							700/1	700/1	700/1		700/1		700/1	700/1	700/1		700/1		700/1
Other																			
Time (Min)				3						4	5					4	5		
Power (RPM)				75						75	88					75	88		
Normal Speed (TAS)				200						200	250					200	250		
HELOs																			
Time (Min)	30						45						15						15
Power (% of Torque)	75						75						75						75
Normal Speed (TAS)	100						100						100						100

Table A.1-1 Misson Profile Data Sheets
Ranges

Aircraft:	R64 300-500	R64 500-1K	R64 1K-5K	R64 5K-20K	R64 20K-50K	R65 100-300	R65 300-500	R65 500-1K	R65 1K-5K	R65 5K-20K	R65 20K-50K	ALAMO 100-300	ALAMO 300-500	ALAMO 500-1K	ALAMO 1K-5K	ALAMO 5K-20K	ALAMO 20K-50K	R71 100-300	R71 300-500
AV-8																			
Time (Min)	1		1			1	1									10			
Power (RPM)	93		97			93	93									75			
Normal Speed (TAS)	480		450			480	480									300			
A-10																			
Time (Min)	3	3	3	8			2	2	2	2		1	1						2
Power (RPM)	90	90	90	90			90	90	90	93		90	90						90
Normal Speed (TAS)	300	300	300	275			300	300	300	275		300	300						300
B-1																			
Time (Min)																			2
Power (RPM)																			95
Normal Speed (TAS)																			550
Supersonic Speed/Time																			
B-2																			
Time (Min)			10						10							6			
Power (RPM)			88						88							88			
Normal Speed (TAS)			420						420							420			
B-52																			
Time (Min)	15						15						3						2
Power (RPM)	92						92						92						92
Normal Speed (TAS)	380						380						380						380
C-130																			
Time (Min)	10						10						5						5
Power (% of Torque)	75						75						75						75
Normal Speed (TAS)	250						250						250						250
EF-111																			
Time (Min)																			1
Power (RPM)																			100
Normal Speed (TAS)																			540
Supersonic Speed/Time																			
F-14																			
Time (Min)				10						10						3			
Power (RPM)				90						90						90			
Normal Speed (TAS)				480						480						480			
Supersonic Speed/Time																			
F-15C																			
Time (Min)	1	1	1	5	5		1	1	1	5	5		1	1	1	3	3		2
Power (RPM)	95	95	95	95	95		95	95	95	95	95		95	95	95	95+AB	5		95
Normal Speed (TAS)	480	480	480	480	480		480	480	480	480	480		480	480	480	480	480		480
Supersonic Speed/Time																700/2	700/2		

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	R64 300-500	R64 500-1K	R64 1K-5K	R64 5K-20K	R64 20K-50K	R65 100-300	R65 300-500	R65 500-1K	R65 1K-5K	R65 5K-20K	R65 20K-50K	ALAMO 100-300	ALAMO 300-500	ALAMO 500-1K	ALAMO 1K-5K	ALAMO 5K-20K	ALAMO 20K-50K	R71 100-300	R71 300-500
F-15E																			
Time (Min)	2	2	1	5	5	2	2	2	1	5	5	2	2	2	1	5	5	2	2
Power (RPM)	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Normal Speed (TAS)	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
Supersonic Speed/Time																			
F-16																			
Time (Min)	1	1	1	5	5		1	1	1	5	5		1	1	1	3	3		2
Power (RPM)	95	95	95	95	95		95	95	95	95	95		95	95	95	95+AB	5		95
Normal Speed (TAS)	480	480	480	480	480		480	480	480	480	480		480	480	480	480	480		480
Supersonic Speed/Time																700/2	700/2		
F-18																			
Time (Min)	1	1	1	5	5		1	1	1	5	5		1	1	1	3	3		2
Power (RPM)	95	95	95	95	95		95	95	95	95	95		95	95	95	95+AB	5		95
Normal Speed (TAS)	480	480	480	480	480		480	480	480	480	480		480	480	480	480	480		480
Supersonic Speed/Time																700/2	700/2		
F-111																			
Time (Min)	3	3	3	3		2	3	3	3	3		2	3	3	3	3		1	1
Power (RPM)	100	100	100	100		100	100	100	100	100		100	100	100	100	100		100	100
Normal Speed (TAS)	540	540	540	540		540	540	540	540	540		540	540	540	540	540		540	540
Supersonic Speed/Time																			
F-117																			
Time (Min)				10						10									
Power (RPM)				90						90									
Normal Speed (TAS)				480						480									
TORNADO																			
Time (Min)	2	2		2		8	8								2	2	2		2
Power (RPM)	90	90		90		85	85								90	90	90		90
Normal Speed (TAS)	450	450		450		350	350								450	450	450		450
Supersonic Speed/Time	700/1	700/1		700/1															
Other																			
Time (Min)				5					5	5									
Power (RPM)				88					75	88									
Normal Speed (TAS)				250					200	250									
HELOs																			
Time (Min)						15						30	20	10				20	
Power (% of Torque)						75						75	75	75				75	
Normal Speed (TAS)						100						100	100	100				100	

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	R71 500-1K	R71 1K-5K	R71 5K-20K	R71 20K-50K	R74 100-300	R74 300-500	R74 500-1K	R74 1K-5K	R74 5K-20K	R74 20K-50K	R75 100-300	R75 300-500	R75 500-1K	R75 1K-5K	R75 5K-20K	R75 20K-50K	R76 100-300	R76 300-500	R76 500-1K
AV-8																			
Time (Min)					2	4	1	1	1		1	1							
Power (RPM)					93	93	97	97	60		97	97							
Normal Speed (TAS)					480	480	480	450	300		480	480							
A-10																			
Time (Min)	5	1	1					2	2					3	3				
Power (RPM)	90	90	93					90	93					90	93				
Normal Speed (TAS)	300	300	275					300	275					300	275				
B-1																			
Time (Min)	9					3	2		3			3	2		3			3	2
Power (RPM)	95					95	95		A/B			95	95		A/B			95	95
Normal Speed (TAS)	550					550	550					550	550					550	550
Supersonic Speed/Time									700/3						700/3				
B-2																			
Time (Min)		5							8					8					
Power (RPM)		88							88					88					
Normal Speed (TAS)		420							420					420					
B-52																			
Time (Min)						8						6						8	
Power (RPM)						95						94						94	
Normal Speed (TAS)						420						420						420	
C-130																			
Time (Min)						10					10							10	
Power (% of Torque)						75					75							75	
Normal Speed (TAS)						250					250							250	
EF-111																			
Time (Min)	2	2				7					1	2	2					1	2
Power (RPM)	100	100				100/AB					100/AB	100	100					100/AB	100
Normal Speed (TAS)	540	540				540					540	540	540					540	540
Supersonic Speed/Time						700/2					700/2							700/2	
F-4																			
Time (Min)	1	1	1				1	1	1				2	2	2				2
Power (RPM)	95	96	96				95	96	96				95	96	96				95
Normal Speed (TAS)	180	180	180				180	180	180				180	180	180				180
Supersonic Speed/Time																			
F-14																			
Time (Min)				3			10	5					5	3					5
Power (RPM)				98			100/AB	100/AB					100/AB	100/AB					100/AB
Normal Speed (TAS)				500			600	600					600	600					600
Supersonic Speed/Time							700/1	700/1					700/1	700/1					700/1

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	R64 300-500	R64 500-1K	R64 1K-5K	R64 5K-20K	R64 20K-50K	R65 100-300	R65 300-500	R65 500-1K	R65 1K-5K	R65 5K-20K	R65 20K-50K	ALAMO 100-300	ALAMO 300-500	ALAMO 500-1K	ALAMO 1K-5K	ALAMO 5K-20K	ALAMO 20K-50K	R71 100-300	R71 300-500
F-15C																			
Time (Min)	2	5	5	5		3	3	2	6	4		3	3	2	6	4		3	3
Power (RPM)	95	96	95	95		95	95	95	95	95		95	95	95	95	95		95	95
Normal Speed (TAS)	480	480	480	520		480	480	480	480	520		480	480	480	480	520		480	480
Supersonic Speed/Time			700/2	700/2					700/2	700/2					700/2	700/2			
F-15E																			
Time (Min)	2	1	5	5	2	2	2	1	5	5	2	2	2	1	5	5	2	2	2
Power (RPM)	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Normal Speed (TAS)	480	480	480	510	480	480	480	480	480	510	480	480	480	480	480	510	480	480	480
Supersonic Speed/Time																			
F-16																			
Time (Min)	2	5	5	5		3	3	2	6	4		3	3	2	6	4		3	3
Power (RPM)	95	96	95	95		95	95	95	95	95		95	95	95	95	95		95	95
Normal Speed (TAS)	480	480	480	520		480	480	480	480	520		480	480	480	480	520		480	480
Supersonic Speed/Time			700/2	700/2					700/2	700/2					700/2	700/2			
F-18																			
Time (Min)	2	5	5	5		3	3	2	6	4		3	3	2	6	4		3	3
Power (RPM)	95	96	95	95		95	95	95	95	95		95	95	95	95	95		95	95
Normal Speed (TAS)	480	480	480	520		480	480	480	480	520		480	480	480	480	520		480	480
Supersonic Speed/Time			700/2	700/2					700/2	700/2					700/2	700/2			
F-111																			
Time (Min)	1					1	1	3	4			1	1	3	4			1	1
Power (RPM)	100					100	100	100/AB	100/AB			100	100	100/AB	100/AB			100	100
Normal Speed (TAS)	540					540	540	540	480			540	540	540	480			540	540
Supersonic Speed/Time								700/2	700/2					700/2	700/2				
F-117																			
Time (Min)			5						5						5				
Power (RPM)			98						98						98				
Normal Speed (TAS)			540						540						540				
TORNADO																			
Time (Min)		2	2	2		2								2	2		10	10	10
Power (RPM)		90	90	90		90								90	90		90	90	90
Normal Speed (TAS)		450	450	450		450								450	450		450	450	450
Supersonic Speed/Time				700/1													700/3	700/3	700/3
Other																			
Time (Min)		8						10					5	5					
Power (RPM)		88						88					75	92					
Normal Speed (TAS)		250						250					200	300					
HELOs																			
Time (Min)					30						30						30		
Power (% of Torque)					75						75						75		
Normal Speed (TAS)					100						100						100		

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	R76 1K-5K	R76 5K-20K	R76 20K-50K	R4808W 1K-5K	R4808W 5K-20K	R4808W 20K-50K	R4809A 100-300	R4809A 300-500	R4809A 500-1K	R4809A 1K-5K	R4809A 5K-20K	R4809A 20K-50K	ECE 100-300	ECE 300-500	ECE 500-1K	ECE 1K-5K	ECE 5K-20K	ECE 20K-50K	ECW 100-300
AV-8																			
Time (Min)					8								1	1					
Power (RPM)					75								93	93					
Normal Speed (TAS)					300								480	480					
A-10																			
Time (Min)	3	3												1	1	1			
Power (RPM)	90	93												90	90	90			
Normal Speed (TAS)	300	275												300	300	300			
B-1																			
Time (Min)		3												3	2		3		
Power (RPM)		A/B												95	95		A/B		
Normal Speed (TAS)														550	550				
Supersonic Speed/Time		700/3															700/3		
B-2																			
Time (Min)		8			4												5		
Power (RPM)		88			75												88		
Normal Speed (TAS)		420			360												420		
B-52																			
Time (Min)					5									4					
Power (RPM)					80									92					
Normal Speed (TAS)					350									400					
C-130																			
Time (Min)					10		10							10					
Power (% of Torque)					65		75							75					
Normal Speed (TAS)					220		120							250					
EF-111																			
Time (Min)	2													6					
Power (RPM)	100													100					
Normal Speed (TAS)	540													540					
Supersonic Speed/Time																			
F-4																			
Time (Min)	2	2													1	1	1		
Power (RPM)	96	96													95	96	96		
Normal Speed (TAS)	180	180													180	180	180		
Supersonic Speed/Time																			
F-14																			
Time (Min)	3				8												5		
Power (RPM)	100/AB				90												92		
Normal Speed (TAS)	600				450												450		
Supersonic Speed/Time	700/1																		

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	R76 1K-5K	R76 5K-20K	R76 20K-50K	R4808W 1K-5K	R4808W 5K-20K	R4808W 20K-50K	R4809A 100-300	R4809A 300-500	R4809A 500-1K	R4809A 1K-5K	R4809A 5K-20K	R4809A 20K-50K	ECE 100-300	ECE 300-500	ECE 500-1K	ECE 1K-5K	ECE 5K-20K	ECE 20K-50K	ECW 100-300
F-15C																			
Time (Min)	2	6	4			4					2	2		3	3			3	3
Power (RPM)	95	95	95			85					95	95		95	95			95/AB	95/AB
Normal Speed (TAS)	480	480	520			350					480	480		480	480			480	520
Supersonic Speed/Time		700/2	700/2															700/2	700/2
F-15E																			
Time (Min)	1	5	5			4	2	2	2	2	2	2	2	2	2	2	2	2	2
Power (RPM)	95	95	95			85	95	95	95	95	95	95	95	95	95	95	95	95	95
Normal Speed (TAS)	480	480	510			350	480	480	480	480	480	480	480	480	480	480	480	480	480
Supersonic Speed/Time																			
F-16																			
Time (Min)	2	6	4			4					2	2		3	3		3	3	
Power (RPM)	95	95	95			85					95	95		95	95		95/AB	95/AB	
Normal Speed (TAS)	480	480	520			350					480	480		480	480		480	520	
Supersonic Speed/Time		700/2	700/2														700/2	700/2	
F-18																			
Time (Min)	2	6	4			4					2	2		3	3		3	3	
Power (RPM)	95	95	95			85					95	95		95	95		95/AB	95/AB	
Normal Speed (TAS)	480	480	520			350					480	480		480	480		480	520	
Supersonic Speed/Time		700/2	700/2														700/2	700/2	
F-111																			
Time (Min)	3	4			5									1	1	3	4		
Power (RPM)	100/AB	100/AB			90									100	100	100	100		
Normal Speed (TAS)	540	480			350									540	540	540	480		
Supersonic Speed/Time	700/2	700/2																	
F-117																			
Time (Min)		5															5		
Power (RPM)		98															98		
Normal Speed (TAS)		540															540		
TORNADO																			
Time (Min)	10	10											1	25					
Power (RPM)	90	90											90	85					
Normal Speed (TAS)	450	450											450	300					
Supersonic Speed/Time	700/3	700/3																	
Other																			
Time (Min)	10				5					7					3				
Power (RPM)	88				92					85					75				
Normal Speed (TAS)	250				300					220					200				
HELOs																			
Time (Min)				20									30						30
Power (% of Torque)				75									75						75
Normal Speed (TAS)				100									100						100

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	ECW 300-500	ECW 500-1K	ECW 1K-5K	ECW 5K-20K	ECW 20K-50K	ECS 100-300	ECS 300-500	ECS 500-1K	ECS 1K-5K	ECS 5K-20K	ECS 20K-50K	PAHUTE 1K-5K	PAHUTE 5K-20K	PAHUTE 20K-50K	COY 100-300	COY 300-500	COY 500-1K	COY 1K-5K	COY 5K-20K
AV-8																			
Time (Min)												1			7	7			4
Power (RPM)												93			93	93			93
Normal Speed (TAS)												480			480	480			400
A-10																			
Time (Min)	1	1	1				5	10	3	3		2	2				10	10	
Power (RPM)	90	90	90				90	90	90	93		90	93				90	90	
Normal Speed (TAS)	300	300	300				300	300	300	275		300	275				300	300	
B-1																			
Time (Min)	3	2		3				3				2					4	4	3
Power (RPM)	95	95		A/B				95				95					95	95	A/B
Normal Speed (TAS)	550	550						550				550					550	550	
Supersonic Speed/Time				700/3															700/3
B-2																			
Time (Min)				5						5			4						10
Power (RPM)				88						88			88						88
Normal Speed (TAS)				420						420			420						420
B-52																			
Time (Min)	1								4			1				15			
Power (RPM)	92								92			92				92			
Normal Speed (TAS)	400								400			400				400			
C-130																			
Time (Min)	10						5					5				40			
Power (% of Torque)	75						75					75				75			
Normal Speed (TAS)	250						250					250				250			
EF-111																			
Time (Min)	6											3				5			15
Power (RPM)	100											100				100			100
Normal Speed (TAS)	540											540				540			510
Supersonic Speed/Time																			
F-4																			
Time (Min)		1	1	1						2		1	1				3	2	
Power (RPM)		96	95	96						90		95	96				95	96	
Normal Speed (TAS)		180	180	180						180		180	180				180	180	
Supersonic Speed/Time																			
F-14																			
Time (Min)				5						5		5						10	5
Power (RPM)				92						90		95						100	100/AB
Normal Speed (TAS)				450						450		540						600	600
Supersonic Speed/Time																			700/1

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	ECW 300-500	ECW 500-1K	ECW 1K-5K	ECW 5K-20K	ECW 20K-50K	ECS 100-300	ECS 300-500	ECS 500-1K	ECS 1K-5K	ECS 5K-20K	ECS 20K-50K	PAHUTE 1K-5K	PAHUTE 5K-20K	PAHUTE 20K-50K	COY 100-300	COY 300-500	COY 500-1K	COY 1K-5K	COY 5K-20K
F-15C																			
Time (Min)	3	3		3	3		2	2		2	2		2	2		3	3	3	10
Power (RPM)	95	95		95	95		95	95		95	95		95	95		95	95	95	95
Normal Speed (TAS)	480	480		480	520		480	480		480	520		480	520		480	480	480	480
Supersonic Speed/Time										700/2	700/2								700/2
F-15E																			
Time (Min)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	5	5	5	5	5
Power (RPM)	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Normal Speed (TAS)	480	480	480	480	510	480	480	480	480	480	510	480	480	510	480	480	480	480	480
Supersonic Speed/Time																			
F-16																			
Time (Min)	3	3		3	3		2	2		2	2		2	2		3	3	3	10
Power (RPM)	95	95		95	95		95	95		95	95		95	95		95	95	95	95
Normal Speed (TAS)	480	480		480	480		480	480		480	520		480	520		480	480	480	480
Supersonic Speed/Time										700/2	700/2								700/2
F-18																			
Time (Min)	3	3		3	3		2	2		2	2		2	2		3	3	3	10
Power (RPM)	95	95		95	95		95	95		95	95		95	95		95	95	95	95
Normal Speed (TAS)	480	480		480	520		480	480		480	520		480	520		480	480	480	480
Supersonic Speed/Time										700/2	700/2								700/2
F-111																			
Time (Min)	1	1	3	4					2	2		1			2	2	2	2	3
Power (RPM)	100	100	100	100					90	90		95			100	100	100	100	100
Normal Speed (TAS)	540	540	540	480					400	350		480			480	480	480	480	480
Supersonic Speed/Time															700/1	700/1	700/1	700/1	700/1
F-117																			
Time (Min)				5									3						15
Power (RPM)				98									98						90
Normal Speed (TAS)				540									540						500
TORNADO																			
Time (Min)	10				8														
Power (RPM)	85				85														
Normal Speed (TAS)	350				350														
Supersonic Speed/Time																			
Other																			
Time (Min)			7						5	5		3	3					10	
Power (RPM)			85						75	92		75	92					75	
Normal Speed (TAS)			220						200	300		200	300					200	
HELOs																			
Time (Min)						20						10				60			
Power (% of Torque)						75						75				80			
Normal Speed (TAS)						100						100				120			

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	COY 20K-50K	REV 100-300	REV 300-500	REV 500-1K	REV 1K-5K	REV 5K-20K	CAL 100-300	CAL 300-500	CAL 500-1K	CAL 1K-5K	CAL 5K-20K	CAL 20K-50K	ELGIN 100-300	ELGIN 300-500	ELGIN 500-1K	ELGIN 1K-5K	ELGIN 5K-20K	ELKGIN 20K-50K	SALLY 500-1K
AV-8																			
Time (Min)		2	2								20								
Power (RPM)		93	93								75								
Normal Speed (TAS)		480	480								300								
A-10																			
Time (Min)			20						5	5	20						30		
Power (RPM)			90						90	90	85						93		
Normal Speed (TAS)			300						300	300	200						275		
B-1																			
Time (Min)				8							30								
Power (RPM)				95							85								
Normal Speed (TAS)				550							300								
Supersonic Speed/Time																			
B-2																			
Time (Min)						15					10								
Power (RPM)						88					88								
Normal Speed (TAS)						420					480								
B-52																			
Time (Min)	15		10								50							10	
Power (RPM)	95		88								80							80	
Normal Speed (TAS)	480		400								300							300	
C-130																			
Time (Min)			40					5			40			20					
Power (% of Torque)			75					75			60			75					
Normal Speed (TAS)			250					250			200			250					
EF-111																			
Time (Min)			16								25								
Power (RPM)			100								95								
Normal Speed (TAS)			540								350								
Supersonic Speed/Time																			
F-4																			
Time (Min)											5						20		10
Power (RPM)											95						100		90
Normal Speed (TAS)											180						180		180
Supersonic Speed/Time																			
F-14																			
Time (Min)					5	5				10	10						30		
Power (RPM)					100	100				100	100						100/AB		
Normal Speed (TAS)					600	600				600	600						600		
Supersonic Speed/Time																	700/2		

Note: Altitude blocks below 20K are considered to be AGL

Aircraft:	COY 20K-50K	REV 100-300	REV 300-500	REV 500-1K	REV 1K-5K	REV 5K-20K	CAL 100-300	CAL 300-500	CAL 500-1K	CAL 1K-5K	CAL 5K-20K	CAL 20K-50K	ELGIN 100-300	ELGIN 300-500	ELGIN 500-1K	ELGIN 1K-5K	ELGIN 5K-20K	ELKGIN 20K-50K	SALLY 500-1K
F-15C																			
Time (Min)	5		3	3	3	7		5	10	5	10	10		5	10	5	10	10	
Power (RPM)	95		95	95	95	95		95	95	95	95	95		95	95	95	95	95	
Normal Speed (TAS)	520		480	480	480	480		480	480	480	480	520		480	480	480	480	520	
Supersonic Speed/Time	700/2					700/2					700/2	700/2					700/2	700/2	
F-15E																			
Time (Min)	5	8	8	8	8	8	1	1	5	5	20	20	1	1	5	5	20	20	
Power (RPM)	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	
Normal Speed (TAS)	510	480	480	480	480	510	480	480	480	480	550	550	480	480	480	480	550	550	
Supersonic Speed/Time											700/1	700/1					700/1	700/1	
F-16																			
Time (Min)	5		3	3	3	7		5	10	5	10	10		5	10	5	10	10	
Power (RPM)	95		95	95	95	95		95	95	95	95	95		95	95	95	95	95	
Normal Speed (TAS)	520		480	480	480	480		480	480	480	480	520		480	480	480	480	520	
Supersonic Speed/Time	700/2					700/2					700/2	700/2					700/2	700/2	
F-18																			
Time (Min)	5		3	3	3	7		5	10	5	10	10		5	10	5	10	10	
Power (RPM)	95		95	95	95	95		95	95	95	95	95		95	95	95	95	95	
Normal Speed (TAS)	520		480	480	480	480		480	480	480	480	520		480	480	480	480	520	
Supersonic Speed/Time	700/2					700/2					700/2	700/2					700/2	700/2	
F-111																			
Time (Min)		4	4	7	7	7				20				5	5	10	10		
Power (RPM)		100	100	100	100	100				85				95	95	95	95		
Normal Speed (TAS)		480	480	480	480	480				350				480	480	480	480		
Supersonic Speed/Time		700/1	700/1	700/1	700/1	700/1													
F-117																			
Time (Min)						15					15						45		
Power (RPM)						90					90						90		
Normal Speed (TAS)						500					500						480		
Other																			
Time (Min)						10					10						10		
Power (% of Torque)						75					75						75		
Normal Speed (TAS)						200					200						200		
HELOs																			
Time (Min)							60	30					60						30
Power (% of Torque)							80	80					80						80
Normal Speed (TAS)							120	120					120						120

Table A.1-1 Mission Profile Data Sheets
Ranges

Aircraft:	SALLY 1K-10K	SALLY 10K-20K	R4806E
AV-8			
Time (Min)		16	
Power (RPM)		75	
Normal Speed (TAS)		300	
A-10			
Time (Min)	15		
Power (RPM)	90		
Normal Speed (TAS)	300		
B-1			
Time (Min)	20		
Power (RPM)	85		
Normal Speed (TAS)	300		
Supersonic Speed/Time			
B-2			
Time (Min)			20
Power (RPM)			88
Normal Speed (TAS)			420
B-52			
Time (Min)		10	15
Power (RPM)		80	92
Normal Speed (TAS)		300	400
C-130			
Time (Min)	20		
Power (% of Torque)	60		
Normal Speed (TAS)	200		
F-14			
Time (Min)		6	
Power (RPM)		90	
Normal Speed (TAS)		400	
Supersonic Speed/Time			

Aircraft:	SALLY 1K-10K	SALLY 10K-20K	R4806E
F-15C			
Time (Min)		8	
Power (RPM)		85	
Normal Speed (TAS)		350	
Supersonic Speed/Time			
F-15E			
Time (Min)		8	
Power (RPM)		85	
Normal Speed (TAS)		350	
Supersonic Speed/Time			
F-16			
Time (Min)		8	
Power (RPM)		85	
Normal Speed (TAS)		350	
Supersonic Speed/Time			
F-18			
Time (Min)		8	
Power (RPM)		85	
Normal Speed (TAS)		350	
Supersonic Speed/Time			
F-111			
Time (Min)		8	
Power (RPM)		90	
Normal Speed (TAS)		350	
Supersonic Speed/Time			
F-117			
Time (Min)		10	20
Power (RPM)		85	90
Normal Speed (TAS)		350	480
Other			
Time (Min)	10		7
Power (% of Torque)	75		70
Normal Speed (TAS)	200		180

Note: Altitude blocks below 20K are considered to be AGL

Table A.1-2 ISAFAF Flight Activity

INDIAN SPRINGS FLYING

	A-6	A-7	AV-8	A-10	C-5	C-9	C-12	C-130	C-141	F-4	F-14	F-15	F-16
1990	7	10	32	12	2		11	44	14	2	8	11	69
1991	1		42	11	9	3	10	16	3	1		24	29
1992			10	11	19	8	13	36	52		2	13	58
1993	2			11	1	2	3	26	7	11	5	14	38
1994	1		2	13		21	6	35	4	12	7	8	53
1995			302	11	1		1	37	4	16	4	12	62
TOTAL	11	10	388	69	32	34	44	194	84	42	26	82	309

	F-18	F-111	KC-10	KC-135	Light A/C	T-37	T-38	T-45	Tornado	HELO	U-21	Other	Totals
1990	15	1			37	72	1			237	9	35	629
1991	1		6		24	80	5			115	4	15	399
1992	33	5		3	27	75	26			241	7	31	670
1993	6	5		4	16		1		2	78		19	251
1994	10	6		12	22	2	1		2	105	6	14	342
1995	4	10		4	24	2	3	3	28	392		43	963
TOTAL	69	27	6	23	150	231	37	3	32	1168	26	157	3254

	IFEs	Diverts
1991	9	36
1992	9	38
1993	13	21
1994	25	15
1995	24	25
Total	80	135

Table A.1-3 below covers the activities at TTR since 1986. The number of sorties are averaged for the period 1986-1992 and then there is a dramatic drop in 1993 when the 37th Tactical Fighter Wing moved from Tonopah to Holloman AFB, New Mexico.

Table A.1-3. Tonopah Test Range Activities

	Aircraft Sorties	*Aircraft IFEs*	*TDY Personnel*
1986	9,250	96	2,500
1987	9,250	96	2,500
1988	9,250	96	2,500
1989	9,250	96	2,500
1990	9,250	96	2,500
1991	9,250	96	2,500
1992	9,250	96	2,500
1993	2,450	9	275
1994	2,391	9	275
1995	2,386	7	275

APPENDIX A.2

MTR USE AND DESCRIPTIONS

Appendix A.2 MTR Use and Descriptions (page 1 of 2)

Route	*#/Year*	*Acft Type*	*Scheduling Agency*
IR 286	4	F-4	99 RANG
	2	F-15E	
	4	HELO	All tactical spread, 95% thrust, 500-1000 / AGL
VR 222	2	F-16	99 RANG
	3	F-15E	
	3	F-18	All tactical spread, 95% thrust, 500-1,000 / AGL
	4	T-38	
VR 1406	2	F-15E	99 RANG
IR 234	None		Edwards
IR 235	None		Edwards
IR 237	None		Edwards
IR 238	None		Edwards
IR 425	3	B-52	Edwards
	2	B-1	
VR 1214	5	EA-6	Edwards
	61	B-1	
	50	B-2	Centerline, all 95% thrust (avg.), 500-1,000 AGL
	50	F-16	
	1	F-14	
	6	MC-130	
	6	F-15	
	32	F-16	All tactical spread, 95% thrust, 500-1,000 AGL
	41	F-18	
	49	F-4	
IR 279	26	B-1	MASMS
IR 282	12	F-16	Mountain Home
VR 1252	66	F-18	NAS Lemoore Due 23 Aug 96
VR 1253	15	F-18	NAS Lemoore All tactical spread, 200-100 AGL, 95
VR 1259	113	F-18	NAS Lemoore
VR 1260	7	F-18	NAS Lemoore
VR 208	441	F-18	NAS Lemoore
V209	79	F-18	NAS Lemoore
IR 200	2	B-1	Point Mugu
	2	B-52	
	19	A-6	Centerline, all 95% thrust (avg.), 500-1,000AGL
	19	F-4	
	19	P-3	
	19	F-14	
	19	CALCM	

Appendix A.2 MTR Use and Descriptions (page 2 of 2)

Route	*#/Year*	*Acft Type*	*Scheduling Agency*
IR 206	1	A-6	Point Mugu
	1	F-4	
	1	P-3	Centerline, all 95% thrust (avg.), 500-1,000 AGL
	1	F-14	
	1	CALCM	

APPENDIX A.3

AIRCRAFT MISSION DESCRIPTIONS

APPENDIX A.3

MISSION DESCRIPTIONS

F-15C Eagles

Aircraft Handling Characteristics/Local Area Orientation (AHC) — 0.8 hr, two-ship, MOAs. Mission objective: demonstrate instructor level aircraft handling skills. Mission tasks include: G-awareness exercise, energy maneuverability profile, break turn, high angle of attack maneuvering, stall approaches and recoveries, power comparison / vertical turning exercise, acceleration maneuver and comparison, gun tracking exercise, offensive and defensive perches (6,000 feet slant range), simulated minimum fuel recovery. Altitudes in the area vary from 5,000 AGL to 30,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.0. Cruise and maneuvering power settings vary from 78 percent to military power with as much as 5 minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: 1 AIS pod.

Basic Fighter Maneuvers (BFM) — 0.8 hr, two-ship, MOAs. Mission objectives: employ infrared (IR) and gun ordnance from an offensive position. Maneuver from a defensive position to deny weapons employment. Instruct proper offensive and defensive BFM techniques and fly both in an instructor role. Demonstrate the ability to recognize and defeat all-aspect weapons employment. Recognize all-aspect weapons parameters from both an offensive and defensive perspective. Demonstrate the ability to maneuver from a defensive position to deny all-aspect weapon employment. Mission tasks include: G-awareness exercise, offensive and defensive maneuvering from visual perch setups, offensive and defensive maneuvering from visual perch setups using all-aspect weapons, visual high-aspect BFM, visual missile defense exercise to high-aspect BFM, beyond visual range (BVR) missile defense exercise to high-aspect BFM. Altitudes in the area vary from 10,000 AGL to 30,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.0. Cruise and maneuvering power settings vary from 78 percent to military with as much as 15 minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configurations: 1 AIS pod, 1 AIM-9M PTM, and chaff and flares.

Air Combat Maneuvers (ACM) — 1.0 to 1.2 hrs, two / four / six-ship, four / six / eight / ten adversaries — MOAs or 60 series and Alamo. Mission objectives include: demonstrate ability to fulfill all wingman responsibilities in an element and four- ship intercept against various formations and tactics. Instruct and employ in a four-ship and six-ship area defense and employ ordnance in a tactically sound manner. Mission tasks include: systems check, G-awareness exercise, 2v4 and 4v6 intercepts, establish a four- and six-ship Combat Air Patrol (CAP) for a 15 minute vulnerability period and defend a sector from a composite force attack, intercept and destroy bomber aircraft while attempting to avoid engagements with fighter escorts. Altitudes in the area vary from 10,000 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.1. Cruise and maneuvering power settings vary from 78 percent to military with as much as 10 minutes use of afterburner. Time in the operating area is approximately 30

minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, chaff and flares, and centerline tank.

Step Down Training — 1.3 hrs, two ship, up to four adversaries — Elgin and Caliente MOAs or Alamo and 60 series, or 70 series ranges. Mission objectives include: demonstrate proficiency in basic single- and two-ship tasks at low altitude, down to 300 AGL. Demonstrate proficiency in low altitude offensive (500 AGL minimum) and defensive (300 AGL minimum) tasks. Instruct sound two-ship low altitude CAP employment against four adversaries and employ ordnance in a tactically sound manner. Mission tasks include: G-awareness exercise, low altitude handling characteristics, low altitude turns, low altitude tactical formation, low altitude navigation, vertical awareness exercises, ridge crossings, low altitude threat assessment exercise, surface-to-air threat awareness training, high-to-low and low-to-high intercepts, defensive response exercise, low altitude radar missile defense exercise, terrain masking, low altitude offensive pursuit, low altitude weapons employment, CAP against low or medium altitude adversaries, low-to-high and high-to-low intercepts. Altitudes in the area vary from 300 AGL to 20,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.0. Cruise and maneuvering power settings vary from 78 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 50 minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, and chaff and flares.

Tactical Intercepts — 1.2 hrs, two- or four-ship, four to six adversaries — MOAs, 70 series and ECRs. Mission objectives include: demonstrate the ability to fulfill all wingman responsibilities in a two-ship, four-ship intercept mission against various formations and tactics. Demonstrate instructional level skills in briefing, leading, and debriefing two- and four-ship missions against various formations and tactics. Mission tasks include: G-awareness exercise, 2 v 4 and 4 v 6 intercepts, 2 v 4 and 4 v 6 intercepts using electronic countermeasures (ECM). Altitudes in the area vary from 300 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.5. Cruise and maneuvering power settings vary from 78 percent to military with as much as 10 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, and chaff and flares.

Air-to-Air Weapons Employment — not accomplished on the NAFR

Night — 1.2 hrs, four-ship, four adversaries — 70 series, ECRs, and MOAs. Mission objectives include: Perform as a viable wingman and instruct in a four-ship night area defense and employ ordnance in a tactically sound manner. Mission tasks include: 4v4 intercepts in the area defense role. Altitudes in the area vary from 10,000 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.5. Cruise and maneuvering power settings vary from 78 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, and chaff and flares.

Dissimilar Air Combat Tactics — 1.0 hrs, two / four / six-ship, two / four / six / eight adversaries. MOAs and 70 series ranges. Mission objectives include: perform as a viable wingman in a two-ship point defense scenario, four-ship area defense scenario, and force protection role. Instruct

and employ sound four-ship sweep concepts. Employ ordnance in a tactically sound manner. Mission tasks include: Systems check, G-awareness exercise, establish a two- and four-ship CAP for a 15-minute vulnerability period and defend a sector from a composite force attack, intercept and destroy bomber aircraft while attempting to avoid engagements with fighter escorts, rendezvous with a strike force and provide protection for a strike mission, intercept and engage an all-aspect adversary of numerical superiority. Altitudes in the area vary from 300 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.5. Cruise and maneuvering power settings vary from 78 percent to military with as much as 10 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, and chaff and flares.

Mission Employment — 1.5 hrs, six-ship plus unknown number of friendly aircraft, unknown number of adversaries and bombers with ECM capabilities — MOAs, 70 series, and ECRs. Mission objectives include: demonstrate instructor-level knowledge of planning a composite strike force mission by day and at night; provide force protection for strikers during ingress and egress. Demonstrate instructor-level knowledge of planning a sector defense mission, provide 30 minutes of sector defense against a large composite force, employ weapons in a tactically sound manner. Mission tasks include: perform as Blue Force air-to-air mission commander, systems check, air refueling, defend strike force with escort aircraft by intercepting air threats in a day and night ECM environment, establish CAP procedures to defend against a composite force attack, emphasize intercepting and destroying bomber aircraft, maintain mutual support, maximize force survival in an ECM environment. Altitudes in the area vary from 300 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.5. Cruise and maneuvering power settings vary from 78 percent to military with as much as 10 minutes use of afterburner. Time in the operating area is approximately 90 minutes. Configurations include: 1 AIM-9M PTM, 1 AIS pod, and chaff and flares.

F-15E Strike Eagles

Advanced Handling Characteristics — 1.2 hrs, two-ship — MOAs. Mission tasks: airborne systems checks, G-awareness exercise, AHC profile, gun tracking exercise, 1v1 maneuvering from visual perch setups, local area orientation. Altitudes in the area may vary from 5,000 AGL to 30,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 to mach 1.0. Cruise and maneuvering power settings vary from 92 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configuration: captive AIM-9.

Basic Fighter Maneuvers — 1.0 to 1.2 hrs, two-ship — MOAs. Typical mission tasks: airborne systems checks, 1v1 intercepts to weapons envelope, G-awareness exercise, gun / missile exercises, 1v1 maneuvering from visual perch setups, 1v1 maneuvering from visual high aspect setups. Altitudes in the area may vary from 5,000 AGL to 30,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 to mach 1.0. Cruise and maneuvering power settings vary from 92 percent to military with as much as 10 minutes use of afterburner.

Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and chaff / flares.

Tactical Intercepts — 1.4 hrs, three-ship and four-ship — MOAs and 70 series ranges. Typical mission tasks: airborne systems checks, G-awareness exercise, single-ship intercepts against a low altitude aircraft (500 feet minimum), single-ship intercepts against a two-ship employing a variety of formations and tactics, two / four-ship intercepts from low altitude ingress (simulating night operations) against up to four adversaries employing a variety of formations and tactics. Altitudes in the area may vary from 500 AGL to 40,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 to mach 1.0. Cruise and maneuvering power settings vary from 92 percent to military with as much as 2 minutes use of afterburner. Time in the operating area is approximately 60 minutes. Configuration: captive AIM-9, AIS pod, chaff / flares, and LANTIRN.

Air Combat Maneuvering/Air Combat Tactics — 1.2 hrs, three-ship, one, two, four, or six adversaries — MOAs, 70 series & ECRs. Typical mission tasks: airborne systems checks, G-awareness exercise, two-ship intercepts to high aspect ACM against a single adversary, defensive ACM perches against a single adversary executing multiple attack options, two-ship tactical maneuvering while being attacked randomly by a single adversary, two-ship intercepts against a two-ship at low altitude (500 feet minimum), two-ship short range intercepts against a two-ship employing a variety of formations and tactics, defend a specific point from an air threat for a specific time. Altitudes in the area may vary from 500 AGL to 40,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 to mach 1.0. Cruise and maneuvering power settings vary from 92 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configuration: captive AIM-9, AIS pod, and chaff / flares.

Air-to-Air Weapons Employment — (Nellis Ranges not used)

Surface Attack — 1.6 hrs, two-ship — 70 series or 60 series. Typical mission tasks: airborne systems checks, day and night low altitude navigation to the target area, two-ship day and night low altitude formation training, visual deliveries of simulated nuclear weapons, radar assisted deliveries of nuclear weapons, free-fall weapons deliveries from a pop-up pattern, high and low angle strafe deliveries from a box pattern, medium and low altitude free-fall weapons deliveries using radar and target pod designations, medium and low altitude laser guided bomb (LGB) deliveries with and without buddy lasing, medium and low altitude TGM-65 / TGBU-15 / TAGM-130 deliveries. Altitudes in the area may vary from 75 feet AGL to 25,000 feet MSL. Airspeeds vary from 350 KCAS to 600 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 2 minutes use of afterburner. Time in the operating area is approximately 60 minutes. Configurations include: 200 20mm TP, 1 BDU-38, 4 MK-106, BDU-33s, LANTIRN pods, TGM-65, TGBU-15, TAGM-130, captive AIM-9, and chaff / flares.

Surface Attack Tactics, day/night — 1.5 hrs, two / four-ship, up to four adversaries — 70 series and ECRs. Typical mission tasks include two / four-ship tactical ingress; low / medium altitude,

surface and airborne threat reactions; medium / low altitude, two / four ship attacks on tactical targets; weapons delivery escape maneuvers. Altitudes in the area may vary from 75' AGL to 25,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 350 KCAS to 600 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configurations include: 12 BDU-33, 12 BDU-50, 2 MK-84LD(I), 2 GBU-10(I), captive AIM-9, and chaff / flares.

Weapons, day/night, — 1.4 hrs, two / four-ship, up to four adversaries — 70 series or 60 series. Typical mission tasks include tactical ingress, reactions to airborne and surface threats, delivery of live or inert ordnance on tactical targets, tactical egress. Altitudes in the area may vary from 75' AGL to 25,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 350 KCAS to 600 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 5 minutes use of afterburner. Time in the operating area is approximately 45 minutes. Configurations include 12 live CBU-52 / 58 / 71, 12 live MK-20, 12 live MK-82 AIR, 12 live MK-82 LD, 1 GBU-15(I), 1 GBU-24(I), 1 AGM-65D / G, 2 TGM-65D / G, 2 live GBU-12, 2 live GBU-10, 2 live MK-84 AIR, 2 MK-84 LD, 12 live CBU-87, captive AIM-9, and chaff / flares

Mission Employment — 1.6 hrs, two / four-ship, up to four adversaries — MOAs, 70 series, ECRs. Typical mission tasks include tactical ingress of a coordinated strike package, reaction to airborne and surface threats, delivery of inert ordnance, tactical egress. Altitudes in the area may vary from 300 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to mach 1. Cruise and maneuvering power settings vary from 92 percent to military with as much as 5 minutes use of afterburner. Time in the operating area can be as long as 20 minutes. Configurations include 2 GBU-10(I), 2 GBU-12(I), 12 MK-82AIR(I), 12 MK-82LD(I), captive AIM-9, and chaff / flares.

F-16 Falcons

Advanced Handling Characteristics (AHC) — 1.2 hrs, two-ship — 60 series and MOAs. Mission tasks: airborne systems checks, G-awareness exercise, AHC profile, gun tracking exercise, local area orientation, and low approach at Indian Springs AFAF. Altitudes in the area may vary from 5000 AGL to 30,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 KCAS to mach 1. Cruise and maneuvering power settings vary from 92 percent to military with as much as 4 minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9.

Basic Fighter Maneuvers — 0.9 hrs, two-ship — MOAs. Typical mission tasks: airborne systems checks, G-awareness exercise, gun / missile exercises, 1v1 maneuvering from visual perch setups, 1v1 maneuvering from visual high aspect setups. Altitudes in the area vary from 5000 AGL to 30,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 KCAS to mach 1. Cruise and maneuvering power settings vary from 92 percent to military with as much as 4 minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and flares.

Tactical Intercepts/Air Combat Maneuvering — 1.0 to 1.3 hrs, two- to four-ship — MOAs — Typical mission tasks: airborne systems checks, G-awareness exercise, single-ship intercepts against a low altitude aircraft (500 feet minimum), single-ship intercepts against a two-ship employing a variety of formations and tactics, two/four-ship intercepts from low altitude ingress against up to four adversaries employing a variety of formations and tactics, continuous point defense CAP. Altitudes in the area vary from 500 AGL to 40,000 feet MSL, depending on maneuvers being practiced. Airspeeds vary from 0 KCAS to mach 1. Cruise and maneuvering power settings vary from 92 percent to military with as much as 2 minutes use of afterburner. Time in the operating area is approximately 40 — 45 minutes. Configuration: captive AIM-9, AMD pod, and chaff/ flares.

Air Combat Tactics — 1.1 hrs, four-ship — MOAs. Typical mission tasks: establish a CAP to defend a specified point from four to six adversaries for a specified time period, provide adequate protection of an attack flight inbound and outbound from its assigned target against up to eight adversaries. Altitudes in the area vary from 500 feet for one sortie then 5,000 AGL to 50,000 feet MSL. Airspeeds vary from 0 KCAS to mach 1.3. Cruise and maneuvering power settings vary from 92 percent to military with as much as 4 minutes use of afterburner. Time in the operating area is approximately 35 — 40 minutes. Configuration: captive AIM-9, 1 ALQ-131 pod, AMD pod, and chaff/flares.

Air-to-Air Weapons Employment — (Nellis Ranges not used)

Surface Attack — 1.5 hrs, four-ship — 60 series or 70 series and ECRs. Mission tasks: Airborne weapons systems checks, low altitude visual and radar navigation, single ship low altitude step down training (LASDT) at 300 to 500 AGL and 100 to 300 AGL, two ship low altitude formation at 300 to 500 AGL and 100 to 300 AGL, radar/visual deliveries using computed and manual systems, multiangle computed dive bomb deliveries from curvilinear and pop up patterns, low angle strafe. Altitudes in the area vary from 500 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to 550 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 1 minute use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 1 300-gal tank, 2 SUU-20, 4 to 6 BDU-33, 4 MK-106, and 250 20mm TP.

Surface Attack Tactics — 1.2 hrs, two ship — 60 series or 70 series and EC Ranges. Mission tasks: Two/four-ship low altitude ingress at 300 AGL, low altitude adversary threat reactions, two-ship initial point (IP) to target navigation and attack, single ship threat reactions against surface to air threat emitters, four-ship attacks against enemy air defense targets, attacks employing LGB ordnance and LANTIRN, weapons delivery escape maneuvers, and low altitude egress. Altitudes in the area vary from 500 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to 550 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 1 minute use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 1 300-gal tank, 2 SUU-20, 12 BDU-33, 1 CATM-88, 1 ALIC, 6 MK-82 AIR Inert, 1 Target pod, 1 NAV pod, 2 GBU-12 (I), captive AIM-9, and chaff/flares

Close Air Support — 1.3 hrs, two ship plus one FAC — 60 series. Mission tasks: night low level (500 AGL) using LANTIRN, one- and two-ship Maverick attacks (300 AGL), FAC coordinated attacks, live AGM-65D / G, threat reactions, and tactical egress. Altitudes in the area vary from 500 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to 550 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 1 minute use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 2 370-gal tanks, 1 TGM-65A / B, 1 TGM-65 D / G, 1 AGM-65D / G (live), 2 GBU-12 (inert), 1 nav pod, 1 targeting pod, and chaff / flares.

Weapons — 1.1 to 1.2 hrs, four- to eight-ship, up to eight adversaries — 70 series. Mission tasks: four-ship medium or low altitude ingress, two- or four-ship preplanned attacks with inert and live ordnance, live ordnance deliveries against enemy air defense type targets in high threat environment, live LGB employment with self or buddy illumination, airborne and surface threat reactions, and tactical egress. Altitudes in the area vary from 300 AGL to 50,000 feet MSL. Airspeeds vary from 350 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 92 percent to military with as much as 2 minutes use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 1 300-gal tank, 2 TGM-65D / G, 2 GBU-12 (live), 4 MK-20, 4 CBU-52 / 58, 2 CBU-87 or CBU-58, 6 MK-82 LDGP, 2 MK-84, nav pod, targeting pod, captive AIM-9, and chaff / flares.

Night — 1.3 hrs, two- or four-ship — 60 series or 70 series. Mission tasks: LANTIRN TFR checks, two-ship medium altitude ingress (5,000 AGL minimum) with step down to low altitude (500 AGL), four-ship medium or low altitude ingress, two- or four-ship preplanned night attacks with inert and live ordnance, airborne and surface threat reactions, and tactical egress. Altitudes in the area vary from 500 AGL or 5,000 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to 550 KCAS. Cruise and maneuvering power settings vary from 92 percent to military with as much as 1 minute use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 2 370-gal tanks, 1 300-gal tank, 2 TGM-65D / G, 2 GBU-12 (live), nav pod, targeting pod, and chaff / flares.

Mission Employment — 1.3 hrs, four-ship, four bombers, 4 adversaries — 70 series and ECRs. Mission tasks: night composite force employment or defend a specified area from an adversary air threat for a specified time period with multiple ship CAP and commit, tactical ingress (5,000 feet or 500 AGL min altitude), target area tactics execution, threat reactions, and tactical egress. Altitudes in the area vary from 500 AGL or 5,000 AGL to 30,000 feet MSL. Airspeeds vary from 350 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 92 percent to military with as much as 2 minutes use of afterburner. Time in the operating area is approximately 40 minutes. Configurations: 1 ALQ-131, 2 TGM-65D / G, 1 AIS pod, nav pod, targeting pod, and chaff / flares.

A/OA-10 Thunderbolt IIs

Advanced Handling Characteristics (AHC) — 1.7 hrs, two ship — Alamo, 60 series. Mission objectives: perform advanced handling maneuvers and practice low altitude flying. Mission tasks: local area orientation, low altitude navigation, maneuvering, and formation; vertical

recovery, stall series, and performance exercises. Altitudes vary from 5,000 AGL to 25,000 feet MSL, airspeeds range from 120 to 350 KCAS, power settings range from 75 percent to mil, time in the area is 60-90 min. Configuration: clean.

Basic Fighter Maneuvers (BFM) — 1.7 hrs, two ship — Alamo, 60 series. Mission objectives: perform BFM and practice low altitude flying. Mission tasks: weapons systems checks, low altitude navigation, maneuvering, formation instruction during BFM perch attacks, AIM-9M employment instruction, and ALE-40 flare employment instruction. Altitudes vary from 5,000 AGL to 25,000 feet MSL, airspeeds range from 120 to 350 KCAS, power settings range from 75 percent to mil, time in the area is 60-90 min. Configuration: 1 captive AIM-9M, and flares.

Surface Attack — 1.7 hrs, four-ship — 60 series, 70 series, EC range. Mission objectives include: perform LASTE weapons deliveries, basic heading altitude reference system (HARS) and LASTE option C manual weapons deliveries using normal and degraded HUD modes, demonstrate and instruct curvilinear full system deliveries, high threat LASTE deliveries, long range strafe, two-target strafe, high and low altitude AGM-65 deliveries, Pave Penny employment, MK-20, CBU-52/58/87, LGB and 30mm Combat Mix employment, and multi-ship low altitude tactical navigation and formation. Demonstrate and instruct two-ship holding options, attack formations, mutual support considerations, and delivery options in a high threat and reduced threat environment. Instruct in effective countermeasures against selected threat radar systems. Mission tasks include: conventional box pattern using LASTE, HARS, and LASTE Mode C modes of delivery, low angle, high angle, and long range strafe, two target strafe, curvilinear deliveries, AGM-65 deliveries, MK-20, CBU-52/58/87, LGB deliveries and 30mm CM strafe, Pave Penny and LGB employment, laser team/ground FAC coordination and target acquisition, airborne error analysis, low altitude navigation, maneuvering and formation, two-ship low and medium altitude holding patterns, two-ship attacks, high threat and reduced threat free fall munitions employment, ALR-69, ALE-40, and ECM pod operations and employment. Ingress altitudes vary from 300 AGL to 16,000 feet MSL, airspeed is 300 KCAS, mil power setting. Target area altitudes vary 100 AGL to 25,000 feet MSL, airspeeds 200 to 400 KCAS, power settings vary 75 percent to mil, time in the target area 60-90 min. Configurations include: up to 18 BDU-33s, 4 2.75 inch TP RX, up to 450 rounds 30mm TP or 300 rounds 30mm combat mix, 1 TGM-65A/B or live AGM-65 A/B and 1 TGM-65D/G or live AGM-65D/G, 1 GBU-12, 2 CBU-52/58, 2 CBU-87, 2 MK-20, 6 MK-82LDGP (live), 7 WP RX, 1 ALQ-131 pod, and chaff.

Air-to-air Weapons Employment — (Live AIM-9 firing, not accomplished at Nellis Ranges).

Weapons Employment — 1.7 hrs, two- and four-ship — medium threat scenario uses 60 series, high threat scenarios use 70 series and ECRs. Mission objectives: demonstrate and instruct holding options, low threat tactics, high threat tactics, high threat CAS, use MK 82 bombs, HE rockets, 30mm under simulated 5,000 feet ceiling, multiple two-ship attacks, employ appropriate low drag tactical options, and analyze A-10 heavyweight handling characteristics. Mission tasks: weapons systems checks, reduced threat en route formations, low altitude enrobe formations, multiple two ship holding options, Tactical Air Control System (TACS) coordination, two-ship attacks, multiple two-ship attacks, AGM-65, rocket and gun

employment, reattack options, mutual support and threat suppression options, ALE-40 flares employment, determination of weapons effectiveness, and Pave Penny employment. Medium threat scenario altitudes vary 100 AGL to 25,000 feet MSL, airspeed varies 200 to 400 KCAS, power settings vary 75 percent to mil, 60-90 min. in target area. High threat scenario parameters vary 100 feet to 4000 AGL, 300-330 KCAS ingress, target area airspeed varies 250-350 KCAS, power settings vary 80 percent to mil, 60- 75 minutes in the target area. Configurations include: 12 MK 82LDGP(live), 8 MK 82HDGP (live, cockpit selectable), 14 2.75-inch HE rockets, 3 MK 84 (live) w/FMU-113 Fuse or 2 MK 84 (live) with 1 TGM-65A/B and 1 TGM-65D/G (live AGM-65s may be substituted), 500 rounds 30mm TP, flares/chaff, and Pave Penny pod.

Combat Search and Rescue (SAR) — 1.7 hrs, four ship — 60 series, 70 series, ECRs. Mission objectives: demonstrate ability to perform and instruct basic functions of SAR and SAR in a tactical alert scenario. Mission tasks: visual search techniques, electronic search techniques, command, control, and communications (C^3), strike control and reconnaissance techniques, escort formations, threat suppression/mutual support, weapon employment, Pave Penny employment, and survivor pick-up planning and execution. Altitudes vary 100 AGL to 20,000 feet MSL, airspeeds are 300 KCAS ingress/egress and 200 to 400 KCAS in the target area. Power settings range from 75 percent to mil, with 60 to 90 minutes in target area. Configurations include: 6 BDU-33, 2 TGM-65 A/B/C/D, 400 rounds 30mm TP, 14 2.75-inch WP RX, 1 Pave Penny pod, and flares.

Night — 1.7 hrs, two ship — 60 series. Mission objectives include: demonstrate and instruct basic night weapons deliveries, various flare deliveries, laser, and Pave Penny options, low intensity CAS, Air Interdiction (AI), low threat tactics using illumination flares and MK84 bombs in a night tactical CAS scenario. Mission tasks include: conventional box pattern, high angle strafe, airborne error analysis, flare procedures and deliveries, laser procedures, Maverick and WP rocket employment, TACS coordination, threat suppression. Altitudes vary 2,000 AGL to 20,000 feet MSL, airspeed varies 200 to 400 KCAS, power settings vary 75 percent to mil, 60 to 120 minutes in target area. Configurations include: 9 BDU-33, 1 GBU-12, 2 MK 84LDGP (live), 4 2.75-inch WP RX, 300 rounds 30mm TP, 2 SUU-25 flare dispensers, 8 LUU-2A/B flares, 8 LUU-1/5/6 flares, 2 TGM-65D/G (live AGM-65 may be substituted), Pave Penny pod, and flares.

Dissimilar Air Combat Tactics (DACT)/Defensive Low Altitude Air-to-Air Training (LOWAT) — 1.7 hrs, two-ship, four adversaries — MOAs, or 60 series. Mission objectives include: demonstrate and instruct mutual support and defensive maneuvers during medium altitude ingress with radar air threat (2v2). Demonstrate and instruct two-ship visual lookout, mutual support, and 2v2 defensive maneuvering during LOWAT. Mission tasks include: weapons system check, in-flight instructional techniques, medium altitude DACT 1v2 and 2v2 with one pair of dissimilar aircraft, medium altitude defensive BFM (1v1) with one dissimilar aircraft, 2v2 LOWAT with one pair of dissimilar aircraft, visual lookout, threat identification, defensive initial moves, mutual support, ALR-69, ECM pod, and ALE-40 use. Altitudes range from 300 AGL to 25,000 feet MSL, airspeeds range from 120 KCAS to 450 KCAS, power settings are 80 percent to mil, 60-75 minutes time in the area. Configuration: chaff/flares, 1 ALQ-131, and 1 captive AIM-9M.

Joint Air Attack Team (JAAT) — (Nellis Ranges not used)

Mission Employment (ME) — 1.8 hrs, two / three / four-ship, two dissimilar escort, two adversaries — MOAs, 70 series and ECRs. Mission objectives include: instruct the employment of the AGM-65, gun, free-fall ordnance, and LUU-1 / 2A / B flares and / or NVGs in a complex night composite force scenario against fixed and mobile targets. Instruct multi-ship battlefield air interdiction (BAI) concepts in a complex composite force tactical scenario employing free-fall ordnance against fixed targets. Locate mobile targets using armed reconnaissance. Mission tasks include: Weapons system checks, enrobe formations, armed reconnaissance, target acquisition, free-fall munitions employment, forward firing munitions employment, flare employment, threat identification / mutual support, ALR-69 / ECM pod / ALE-40 employment. Altitudes range from 300 AGL to 30,000 feet MSL, airspeeds range from 300 to 330 KCAS with military power during ingress / egress and 300 to 350 KCAS, military power, in the target area. Time in the target area is 10-15 minutes. Configurations include: 6 BDU-33, 1 TGM-65D / G, Pave Penny pod, 1 captive AIM-9M, 1 ALQ-131, and chaff / flares.

414 CTS/AT Adversary Tactics — F-16C Falcon

Local Area Orientation — 1.2 hrs, two-ship — 70 series, MOAs. Mission objective: local area familiarization and procedures orientation. Mission tasks: G-awareness exercise, air-to-air intercepts, local area orientation, low approach at Indian Springs AFAF. Altitudes in the areas may vary from 10,000 AGL to 50,000 feet MSL, airspeeds vary from 200 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 95 percent to military with usually no use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9.

Single Air Combat (SAC) — 1.2 hrs, two-ship — MOAs. Mission objectives: introduce Former Soviet Union (FSU) formations, basic offensive maneuvers, basic defensive maneuvers, and gun exercises. Typical mission tasks include: FSU close and deployed formations, ranging exercise, offensive SAC to IR missile / gun parameters, tracking and high deflection gunshots, subsequent attacks and separations, defensive SAC, 1v1 maneuvering from visual high aspect setups. Altitudes in the areas may vary from 10,000 AGL to 50,000 feet MSL, airspeeds vary from 200 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 95 percent to military with approximately five minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and chaff / flares.

Element Air Combat (EAC) — 1.2 hrs, two-ship, one adversary — MOAs. Mission objectives: employ FSU element offensive and counter offensive maneuvers against a single bandit from visual perch or beyond visual range (BVR) set-ups. Mission tasks include: demonstrate proficiency in defensive and offensive visual formation tactics to engage, kill, and separate from a single bandit; high aspect SAC tactics, GCI directed intercepts. Altitudes in the areas may vary from 10,000 AGL to 50,000 feet MSL, airspeeds vary from 200 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 95 percent to military with approximately five minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and chaff / flares.

Low Altitude Step Down Training (LASDT) — 1.2 hrs, two-ship, two adversaries — MOAs. Mission objectives: demonstrate proficiency at low altitude to include acceleration, deceleration, turns, terrain masking, ridge crossings; vertical maneuvers to include climbs, descents, slices, low altitude formations, proper threat assessment and defensive reactions, low altitude pursuit and weapons employment; and high-to-low conversions against low altitude targets. Mission tasks: practice FSU low altitude attack formations, low altitude handling, turns, and vertical awareness, defensive reactions, offensive pursuit and weapons employment, high-to-low conversions. Altitudes in the areas may vary from 500 AGL to 30,000 feet MSL, airspeeds vary from 200 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 95 percent to military with approximately five minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and chaff / flares.

Element Combat Tactics (ECT) — 1.2 hrs, two / four-ship, two / four adversaries — MOAs. Mission objectives: practice basic Mig-29 FULCRUM formations and tactics with GCI control against adversary sweep. Introduce advanced FULCRUM intercept and engagement tactics. Properly employ an element against CAP and sweep patterns. Demonstrate proficiency in element integrity, radar and visual search techniques and communications procedures. Use F-16 fire control system (FCS) to simulate proper FULCRUM FCS and FULCRUM weapons employment. Mission tasks include: practice FULCRUM tactics and advanced FULCRUM tactics, under GCI control. Demonstrate proficiency in FULCRUM element tactics, and situational awareness. Altitudes in the areas may vary from 10,000 AGL to 50,000 feet MSL, airspeeds vary from 200 KCAS to mach 1.2. Cruise and maneuvering power settings vary from 95 percent to military with approximately five minutes use of afterburner. Time in the operating area is approximately 30 minutes. Configuration: captive AIM-9, AIS pod, and chaff, / flares.

422 Test & Evaluation Squadron

The 422 TES is dedicated to testing and evaluating various equipment, software, and tactics on F-15C, F-15E, F-16C, HH-60G, and A-10 aircraft. The flight profiles vary with each aircraft type and test profile. Flight profiles generally fall into one of the previous mentioned categories and can be approximated using the corresponding aircraft type in the previous sections.

HH-60 Division USAFWS HH-60G Pave Hawk

Familiarization — 3.0 hrs, two-ship — 60 series ranges, Indian Springs. Familiarize crews with Nellis local flying area and procedures. Mission tasks include: Nellis AFB and Indian Springs AFAF traffic pattern orientation, overflight of remote sites, and local instrument procedures. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 kts to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 90 minutes. Configuration: Forward Looking Infrared (FLIR).

Night Familiarization — 3.0 hrs, two ship — 60 series ranges, Indian Springs. Night area orientation and equipment use. Mission tasks include: enhanced systems and Heads Down Display proficiency demonstration, range orientation with shadow gunnery moving target acquisition, and night desert landing. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 90 minutes. Configuration: FLIR, and 2 M-60 w / 1500 rounds 7.62mm.

Navigation Systems Operations — 2.5 hrs, two-ship — 60 series ranges. Demonstrate proficiency with enhanced systems and degraded operation. Mission tasks include GPS approach, degraded operation of nav systems, and shadow gunnery. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 90 minutes. Configuration: FLIR, and 2 M-60 w / 1500 rounds 7.62mm.

Basic Helicopter Maneuvers (BHM) — 2.0 hrs, two-ship — MOAs, 60 series ranges. Instruct and review basic helicopter maneuvers and two-ship maneuvering. Mission tasks include power and G force management, horizontal and vertical maneuvering, low-level operations, advanced handling maneuvers, two-ship formation maneuvers, tactical formations and turns, in-place / cross / center / split / break / check turns, dig & pinch, and Night Vision Goggles (NVG) maneuvering operations. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 90 minutes. Configuration: clean.

Defensive Maneuvering (DM) Ground — 3.5 hrs, two-ship — 70 series ranges. Demonstrate ability to evade electronic threats. One sortie will be at night. Mission tasks include formation maneuvering, threat area ingress, threat avoidance, and defensive maneuvers against ground based threats. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 2 hours. Configurations: chaff, APR-39, ALQ-144, and FLIR.

Defensive Maneuvering Air — 2.0 hrs, two-ship, up to two helicopter aggressors, up to two fixed wing aggressors — 60 series, MOAs. Instruct defensive maneuvers to counter attacking airborne threats. Mission tasks include ranging exercise, tail-chase maneuvers, counters to tail-chase maneuvers, covering maneuvers, head-on attacks, pitch-back attack, counter to pitch-back attack, one vs. one operations, two vs. one operations, two vs. two operations, one helicopter vs. one fixed-wing fighter, two helicopters vs. one fixed-wing fighter, two helicopters vs. two fixed-wing fighters, and DM box operations. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 90 minutes. Configurations include: FLIR, 2 M-60 with 800 7.62mm blanks, ALQ-144, chaff, and APR-39.

Combat Search and Rescue Task Force Scenario — 2.5 hrs, two-ship, HC-130, rescort aircraft, survivor and ground aggressors — 60 series ranges and Alamo. Instruct Search and Rescue (SAR) in a tactical alert, preplanned scenario. Two sorties will be conducted at night. Mission tasks include: Command, Control and Communications (C3) techniques, visual/electronic search techniques, call for fire, pick-up options, threat suppression/ mutual support, weapon employment, survivor pick-up, and medical exercise. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is approximately 2 hours. Configurations include: FLIR, 2 M-60 with 800 7.62mm blanks, and chaff.

Mission Employment — 4.0 hrs, two-ship, HC-130, rescort aircraft, survivor, fixed-wing or helicopter aggressor, ground aggressors — 70 series and ECRs. Instruct SAR in a preplanned scenario against a hostile force. One sortie will go long-range to Fallon EC range for a deep penetration exercise. Mission tasks include: C3 techniques, visual/ electronic search techniques, call for fire, pick-up options, threat suppression/mutual support, weapon employment, survivor pick-up, and medical exercise. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is usually 2.5 hours. Configurations include: FLIR, 2 M-60 with 1500 7.62mm live, and chaff.

66 Rescue Squadron HH-60G Pave Hawk

The 66 RQS is an operational helicopter rescue squadron that flies in the NAFR to maintain aircrew currency and proficiency. The profiles are similar to the CRQS.

Air-to-ground — 3.0 hrs, one to two-ship — 60 series ranges. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. Cruise and maneuvering power setting is always full throttle for the Pave Hawk. Time in the range area is 60 to 90 minutes. Configuration: FLIR and 2 M-60 w/1500 rounds 7.62mm live.

Electronic Combat — 4.0 hrs, two-ship — 70-Series and ECRs. Altitudes in the area vary from surface to 1,000 AGL, depending on tactics employed. Airspeeds vary from 0 to 140 KCAS. May conduct repelling operations. Time in the range area is usually 2.5 hours. Configurations include: FLIR, 2 M-60 with 1500 7.62mm live, and chaff.

Low-level Navigation Training — 3.0 hrs, one- to three-ship — MOAs. Altitudes in the area vary from surface to 200 AGL. Airspeeds vary from 0 to 140 KCAS. May conduct repelling operations. Time in the range area is usually 2.0 hours. Configurations include: FLIR and 2 M-60 with 1500 7.62mm blanks.

Air Refueling operations are conducted in Mormon Mesa AR track with C-130s providing the fuel. Altitudes vary from as low as 1000 AGL to 6,000 feet MSL. Air refueling airspeed is 115 KCAS. Time in the area is as long as 2.0 hrs.

WS Det (Ellsworth AFB) B-52 Stratofortress

B-52s usually only fly in the NAFR when participating in large force exercises such as Red / Green Flags and the Mission Employment / Strike phases of B-52 Weapons School. They will usually enter from the east through Caliente through the MOAs, 70 series and ECRs or 60 series ranges. They will typically employ as many as three aircraft. They may ingress to the 70 or 60 series ranges at 300 AGL to 39,000 feet MSL, 340 to 420 KTAS. Approximate power settings range from 60 percent to 90 percent RPM and are very dependent on airspeed and altitude. Time in the target areas are 24 to 40 minutes for the 60 series and 30 to 90 minutes for the 70 series ranges.

USAF Air Demonstration Squadron — Thunderbirds — F-16C/D Falcon

Nellis AFB is the home of the USAF Thunderbirds Air Demonstration Squadron. They typically fly as a six-ship for 1.2 hrs flying time per sortie and practice almost exclusively at Indian Springs AFAF within R65, and occasionally at Nellis AFB. They also may fly an incentive / media flight as a single ship using all the same maneuvers, altitudes, and power settings. The Thunderbirds practice three profiles listed in the following tables: a high show, low show, and flat show, to allow for demonstrations in various weather conditions. Altitudes range from 250 AGL to 18,000 feet MSL. Airspeeds vary from 110 KCAS to .94 mach, with power settings from 82 percent to military with 1.5 to 2 minutes of afterburner. Time in the area is 35 to 40 minutes. Configuration — smoke only.

11th to 15th Reconnaissance Squadrons

The mission of the 11th to 15th Reconnaissance Squadrons are to provide long endurance, unmanned aerial reconnaissance, surveillance and target acquisition that produces near real-time multi-sensor imagery and intelligence for the war fighter. Operations commenced September 1996 with the Predator UAVs. The Tier 3 Minus and / or Tier 2 Plus may be operated in the future. The number of sorties flown will be dependent on the availability of aircraft which may grow as high as 30. Initial estimates are for two sorties per week. The Predator flies at 65-100 kts from 1500 AGL to FL250. Tier 2+ and Tier3- will fly at 300+ kts from 1500 AGL to FL600. Sorties lengths will be from 1 hr to 40+ hrs. R63, R64 and R65 will be the primarily operating areas on the Nellis Air Force Range. The main activity on these ranges will be for flight pattern work and use of airspace to climb the UAVs into the positive control area above FL180. Other ranges may be used for target acquisition practice for the training of sensor operators and intel analysis.

Defense Threat Reduction Agency (DTRA)

The DTRA has a 5-year plan which should start in 1998 and go through at least 2002. They intend to build a subterranean building approximately 110 feet 110 feet x 25' high on R64. This building will be blast hardened and earthen covered with at least 20 feet of dirt. Their mission is to test building structures against simulated biological / chemical (bio / chem) agents. At the start of these test, simulated bio / chem agents will be inserted near the structure to test its

integrity under non-blast conditions. As the tests progress, air dropped weapons will be used to deliver the simulated bio/chem weapons. Sensors will be placed throughout the building to test blast and bio/chem intrusion effects. It is expected that a follow-on program will continue to do test past the year 2002.

Sandia National Laboratories (Tonopah Test)

The Sandia mission has been on-going for many years in the Tonopah Test area. Their primary mission is to develop, operate, and maintain a ballistic and flight test range and associated facilities to support special weapons research and development. They also perform quality assurance of special weapons by actual deliveries of weapons taken from the shelf and dropped on an instrumented range. They then analyze the resulting internal function of the weapon. Any explosive which functions is non-nuclear.

USAF Desert Warfare Training Center

The USAF Desert Warfare Training Center, more commonly called "Silver Flag Alpha" provides advanced training to over 2,100 security police personnel annually from Air Force active duty, national Guard and Reserve units on tactical and weapons skills for the defense of Air force bases in a desert environment. The training lasts 14 to 16 days and includes: classroom and practical training on common soldier skills (i.e. claymore mines, patrolling, land navigation. . .), individual and specialized equipment, unit level operations, and small arms marksmanship. The training concludes with a 2 to 3 day field training exercise that provides the unit with a practical evaluation of its strengths and weaknesses. Additionally, the Desert Warfare Training Center provides weapons and tactical training, live-fire ranges and training facilities for an additional 1,500 personnel annually to include other USAF units, Department of Defense Services, and Federal, State, and local law enforcement agencies. These activities take place on a portion of R63 and include small arms live fire and tactics.

APPENDIX A.4

MUNITIONS DATA

APPENDIX A.4

MUNITIONS DATA

Table A.4-1 came directly from the 99 RANS monthly range utilization report data base, which addresses utilization of the NAFR from time available versus time used. The percentage shown in this attachment is an average of both day and nighttime use. The amount of daytime available on the range varies depending on the time of year and its percentage is based on time flown versus time available. Nighttime and weekend use is based solely on time scheduled versus time used (i.e., scheduling effectiveness).

Table A.4-1. NAFR Utilization

	1990	*1991*	*1992*	*1993*	*1994*	*1995*
R61	88	75	81	82	87	85
R62	91	66	57	62	85	88
R63	86	34	24	44	60	72
R64	93	73	76	81	88	87
R65	91	60	52	49	78	84
R71	82	57	68	65	80	77
R74	97	85	82	89	96	96
R75	99	80	78	74	94	96
R76	99	62	68	68	91	94
ECE	87	86	80	82	89	93
ECW	80	77	77	80	85	90
Alamo	82	81	73	71	80	82
Caliente	84	88	84	72	77	83
Coyote	94	96	95	92	95	96
Elgin	79	80	80	65	70	75
Reveille	81	80	75	74	60	82

Table A.4-2 shows the approximate amount of ordnance dropped on the NAFR. The 1994 data came from the Combat Munitions Unit (CMU) and Red Flag records. The CMU only keeps the current year and one previous year of data. Red Flag keeps data for several years, but without the CMU numbers it's not possible to show accurate total data prior to 1994. This information varies from that reported in the "Special Nevada Report" (approximately 1,000 tons per year). The numbers acquired for the Report did not reflect the Red Flag data for that year. Without the Red Flag data, the tonnage for 1994 was 1,338 tons, approximately rounded down to 1,000 tons. In 1991, the Tonopah F-117s and George AFB F-4Gs were still flying on the NRC, hence a slightly larger amount of ordnance. As both George AFB and Tonopah operations closed, the

amount of ordnance decreased slightly. With current projections, the ordnance dropped on the NRC is expected to remain approximately 3,000 tons per year, of which, 47 percent is live (high explosive).

Table A.4-2. Net Weight of Ordnance Dropped on NAFR

	WEIGHT IN TONS		
	Inert	*Live*	*Total*
1991	1998	1692	3690
1992	1948	1662	3610
1993	1779	1636	3415
1994	1641	1393	3034
1995	2401	2103	4504

Note: A.4-3 provides data on ordnance usage at Silver Flag Alpha.

Table A.4-3 provides a detailed breakdown of CY95 57th Wing and TDY ordnance expenditures. Table A.4-4 provides data on ordnance usage at Silver Flag Alpha.

Table A.4-3. CY95 57th Wing and TDY Expenditures					
Noun	*57th Wing*	*Flag Exercises*	*Visiting Units*	*Capstone*	*Total*
20mm TP	22,504				22,504
20mm HEI	930				930
30mm TP	239,591		390	4,215	244,196
30mm HEI	14,337				14,337
Flares	70,209	11,277	7,496	1,104	90,086
Chaff	186,095	182,872	25,777		394,744
LUUs	1,280		69		1,349
AGM-65s	101				101
2.75" RKTS	4,155			73	4,228
BDU-33s	10,819	3,324	201		14,344
BDU-38s	22				22
MK-20s	132		8		140
CBUs	475		24	18	517
GBU-12 inert	145	129	20		294
GBU-10 inert	19	36			55
GBU-15 inert	17	2			19
GBU-12 live	116	72		4	192
GBU-10 live	0	2			2
GBU-24 live	0	5			5
AGM-130 live	1				1
BDU-50s	1,351	2,211			3,562
MK-82 live	1,790	2,000	24	6	3,820
MK-84 inert	390	338	191		919
MK-84 live	278	516	20	34	848
POC: TSGT Hedlind or SSGT Davidson, AFK, 1266					

Table A.4-4. Range 63A Munitions Use

Silver Flag Alpha Munitions Use																
	1986	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
9mm	5500	6500	7000	7500	1500	9000	13020	13020	13020	14000	14000	14000	14000	14000	14000	14000
5.56mm (ball)	843000	844686	667656	927300	295050	1180200	1433100	705900	923100	1357500	1574700	1683300	1683300	1683300	1683300	1683300
5.56mm (tracer)	80000	80160	63360	88000	28000	112000	136000	104000	136000	200000	232000	248000	248000	248000	248000	248000
7.62mm (ball/tracer)	1890000	1501500	1978200	1680000	840000	1680000	1480500	1155000	987000	1680000	1680000	1680000	1680000	1680000	1680000	1680000
40mm Aluminum training round	0	6,300	15,220	16,200	2,250	17,000	11,250	35,100	35,600	40,000	40,000	40,000	40,000	40,000	40,000	40,000
40mm (Talcum power training round)	2500	9950	5000	7500	2500	6250	8125	9750	6625	11250	12500	15000	15000	15000	15000	15000
40mm (Tear Gas Round)	500	500	500	500	100	500	600	600	700	800	1000	1000	1000	1000	1000	1000
40mm (Illumination Round)	500	500	500	500	150	250	300	400	500	600	750	1000	1000	1000	1000	1000
40mm High Explosive Armour Piercing	0	0	0	0	0	0	0	0	0	500	1500	1500	1500	1500	1500	1500
81mm (White Phosphorus)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (High Explosive HE)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (Training Round)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (Illumination Round)	378	315	378	378	108	342	378	378	450	450	450	450	450	450	450	450
50 caliber (Armor Piercing/Incendiary)	28800	18000	37800	48600	39600	34200	41400	25200	39600	37800	37800	37800	37800	37800	37800	37800
12 gauge (OO buckshoot)	500	500	500	500	100	1000	2000	2000	2500	2500	2500	2500	2500	2500	2500	2500
12 gauge (Slug)	100	100	100	100	25	250	500	500	750	750	750	750	750	750	750	750
66mm light anti-tank weapon (LAW)	30	30	30	30	0	30	20	25	30	25	25	25	25	25	25	25
35mm subcaliber projectile for LAW	2288	3224	5408	11544	4550	18200	22100	16900	15665	32500	37700	39000	39000	39000	39000	39000
60mm (High Explosive)	500	500	500	500	500	500	1,500	1,500	1,500	2,000	2,000	3,000	4,000	4,000	4,000	4,000
84mm (AT-4) anti-tank weapon	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HE 441B airburst round	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HEDP 502 anti bunker/armor	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HEAT 551 anti armor	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) 469B smoke round	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) FFV 552 target practice(7.62)	0	0	0	0	0	0	0	0	0	0	50,000	60,000	60,000	60,000	60,000	60,000
90mm Flechette	1000	1000	1000	1000	255	200	0	0	0	0	0	0	0	0	0	0
90mm High Explosive	1000	1000	1000	1000	255	200	0	0	0	0	0	0	0	0	0	0
Ground Burst Simulator	490	630	420	1120	420	1085	1400	1015	1400	1540	2275	2380	2380	2380	2380	2380
Smoke Pot (White)	56	72	48	128	48	124	128	116	128	176	260	272	272	272	272	272
CS Grenade (Tear Gas)	490	630	420	1120	420	1085	1400	1015	1400	1540	2275	3010	3010	3010	3010	3010
Whistler Booby Trap	350	450	300	800	300	775	1000	725	1000	1100	1625	2150	2150	2150	2150	2150
M127A1 Slap Flares	420	540	360	960	360	930	1200	870	1200	1320	1950	2040	2040	2040	2040	2040
Trip Flares	504	648	432	1152	432	1116	1440	1044	1440	1584	2340	2448	2448	2448	2448	2448
Smoke (Green, Purple, Yellow)	798	1026	684	1824	684	1767	2280	1653	2280	1824	3705	3876	3876	3876	3876	3876
Grenade Simulators	910	1170	780	2080	780	2015	2600	2600	2600	2860	4225	4420	4420	4420	4420	4420
5.56mm Blank	49280	126720	84480	225280	84480	218240	281600	204160	281600	309760	457600	478720	478720	478720	478720	478720
7.62mm Blank	14700	37800	25200	67200	25200	65100	84000	60900	84000	92400	136500	142800	142800	142800	142800	142800

APPENDIX A.5

SILVER FLAG ALPHA TRAINING

APPENDIX A.5

SILVER FLAG ALPHA TRAINING

Table A.5-1 covers the activities accomplished on Range 63A, also known as the Silver Flag Alpha training site. It shows the wide variety of law enforcement personnel who train at this site. It is the most complete data on record for the NAFR, with meaningful projections through 1999. Projections after that are straight-lined. These data came from Silver Flag Alpha records.

Table A.5-1. Range 63A Activities

				Silver Flag Alpha Personnel Trained												
	1986	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Air Force Security Police (Active)	1500	1803	1510	2400	2400	2150	1100	1400	1200	1400	1600	1800	2000	2000	2000	2000
Air Force Security Police (National Guard)	150	150	150	150	150	150	400	700	900	1000	1100	1200	1500	1500	1500	1500
Air Force Security Police (Reserve)	200	200	200	200	120	100	50	0	0	500	500	500	500	500	500	500
Air Force Combat Arms Instructors	275	250	275	275	150	275	100	200	200	225	300	300	300	300	300	300
Air Force (Office of Special Investigations)	100	100	100	100	50	150	75	100	110	120	120	120	120	120	120	120
Air Force (All other personnel)	500	500	500	500	500	500	400	500	500	600	700	800	800	800	800	800
Federal Law Enforcement	225	225	225	225	200	225	250	250	250	250	300	300	350	400	400	400
State Law Enforcement (Nevada)	100	100	100	100	100	150	150	150	150	150	150	150	150	150	150	150
Local Law Enforcement	175	175	200	200	200	200	250	250	300	275	400	400	400	400	400	400
Army National Guard (Nevada)	100	200	200	200	50	350	375	400	425	450	450	500	500	500	500	500
Marine Reserve (Nevada)	75	75	75	75	50	300	300	300	300	350	350	350	350	350	350	350
Special Forces (Army)	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Civilian Organizations	50	50	50	50	50	50	15	25	0	25	100	100	100	100	100	100
Navy (Seabees)	0	0	0	0	0	0	0	25	40	50	50	50	50	50	50	50
TOTAL	***3650***	***4028***	***3785***	***4675***	***4220***	***4800***	***3665***	***4500***	***4575***	***5595***	***6320***	***6770***	***7320***	***7370***	***7370***	***7370***
				Silver Flag Alpha Vehicle Use												
	1986	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
SMALL VEHICLES (UNDER 1 TON)																
Diesel Fuel (Gallons)	2000	2000	2000	2000	1000	2000	2000	2000	500	500	100	100	100	100	100	100
Gasoline (Gallons)	500	500	500	500	250	500	500	500	750	850	850	850	850	850	850	850
Mileage Driven	40000	40000	40000	40000	20000	40000	40000	40000	20000	21600	15200	15200	15200	15200	15200	15200
LARGE VEHICLE (1 TON AND OVER)																
Diesel Fuel (Gallons)	2170	2170	2170	2170	1050	2170	2170	2170	2000	2250	2250	2250	2250	2250	2250	2250
Gasoline (Gallons)	1000	1000	1000	1000	500	1000	1000	1000	1750	2000	2000	2000	2000	2000	2000	2000
Mileage Driven	50708	50708	50708	50708	25000	50708	50708	50708	55000	60000	60000	60000	60000	60000	60000	60000

Table A.5-1. Range 63A Activities (continued)

				Silver Flag Alpha Munitions Use												
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
9mm	5500	6500	7000	7500	1500	9000	13020	13020	13020	14000	14000	14000	14000	14000	14000	14000
5.56mm (ball)	843000	844686	667656	927300	295050	1180200	1433100	705900	923100	1357500	1574700	1683300	1683300	1683300	1683300	1683300
5.56mm (tracer)	80000	80160	63360	88000	28000	112000	136000	104000	136000	200000	232000	248000	248000	248000	248000	248000
7.62mm (ball/tracer)	1890000	1501500	1978200	1680000	840000	1680000	1480500	1155000	987000	1680000	1680000	1680000	1680000	1680000	1680000	1680000
40mm Aluminum training round	0	6,300	15,220	16,200	2,250	17,000	11,250	35,100	35,600	40,000	40,000	40,000	40,000	40,000	40,000	40,000
40mm (Talcum power training round)	2500	9950	5000	7500	2500	6250	8125	9750	6625	11250	12500	15000	15000	15000	15000	15000
40mm (Tear Gas Round)	500	500	500	500	100	500	600	600	700	800	1000	1000	1000	1000	1000	1000
40mm (Illumination Round)	500	500	500	500	150	250	300	400	500	600	750	1000	1000	1000	1000	1000
40mm High Explosive Armour Piercing	0	0	0	0	0	0	0	0	0	500	1500	1500	1500	1500	1500	1500
81mm (White Phosphorus)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (High Explosive HE)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (Training Round)	252	210	252	210	210	228	168	210	210	210	210	210	210	210	210	210
81mm (Illumination Round)	378	315	378	378	108	342	378	378	450	450	450	450	450	450	450	450
50 caliber (Armor Piercing/Incendiary)	28800	18000	37800	48600	39600	34200	41400	25200	39600	37800	37800	37800	37800	37800	37800	37800
12 gauge (OO buckshoot)	500	500	500	500	100	1000	2000	2000	2500	2500	2500	2500	2500	2500	2500	2500
12 gauge (Slug)	100	100	100	100	25	250	500	500	750	750	750	750	750	750	750	750
66mm light anti-tank weapon (LAW)	30	30	30	30	0	30	20	25	30	25	25	25	25	25	25	25
35mm subcaliber projectile for LAW	2288	3224	5408	11544	4550	18200	22100	16900	15665	32500	37700	39000	39000	39000	39000	39000
60mm (High Explosive)	500	500	500	500	500	500	1,500	1,500	1,500	2,000	2,000	3,000	4,000	4,000	4,000	4,000
84mm (AT-4) anti-tank weapon	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HE 441B airburst round	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HEDP 502 anti bunker/armor	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) HEAT 551 anti armor	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) 469B smoke round	0	0	0	0	0	0	0	0	0	0	500	500	500	500	500	500
84mm (M3) FFV 552 target practice(7.62)	0	0	0	0	0	0	0	0	0	0	50,000	60,000	60,000	60,000	60,000	60,000
90mm Flechette	1000	1000	1000	1000	255	200	0	0	0	0	0	0	0	0	0	0
90mm High Explosive	1000	1000	1000	1000	255	200	0	0	0	0	0	0	0	0	0	0
Ground Burst Simulator	490	630	420	1120	420	1085	1400	1015	1400	1540	2275	2380	2380	2380	2380	2380
Smoke Pot (White)	56	72	48	128	48	124	128	116	128	176	260	272	272	272	272	272
CS Grenade (Tear Gas)	490	630	420	1120	420	1085	1400	1015	1400	1540	2275	3010	3010	3010	3010	3010
Whistler Booby Trap	350	450	300	800	300	775	1000	725	1000	1100	1625	2150	2150	2150	2150	2150
M127A1 Slap Flares	420	540	360	960	360	930	1200	870	1200	1320	1950	2040	2040	2040	2040	2040
Trip Flares	504	648	432	1152	432	1116	1440	1044	1440	1584	2340	2448	2448	2448	2448	2448
Smoke (Green, Purple, Yellow)	798	1026	684	1824	684	1767	2280	1653	2280	1824	3705	3876	3876	3876	3876	3876
Grenade Simulators	910	1170	780	2080	780	2015	2600	2600	2600	2860	4225	4420	4420	4420	4420	4420
5.56mm Blank	49280	126720	84480	225280	84480	218240	281600	204160	281600	309760	457600	478720	478720	478720	478720	478720
7.62mm Blank	14700	37800	25200	67200	25200	65100	84000	60900	84000	92400	136500	142800	142800	142800	142800	142800

APPENDIX A.6

NAFR GROUND ACTIVITIES

APPENDIX A.6

NAFR GROUND ACTIVITIES

The data in Tables A.6-1 and A.6-2 below covers Air Force, DOE, and contractor personnel ground activities, acres, targets, and roads used during the operations and maintenance of NAFR. Miles driven on the range are for activities such as rebuilding targets, operating threat radars and cleaning up expended ordnance and target debris. The radio and microwave transmissions come from all the communications infrastructure on the range, which feeds data back and forth from Nellis AFB to NAFR. For vehicles, 21 percent were 1 ton or greater, of which 75 percent were diesel powered. Of the remaining 79 percent (under-1-ton vehicles), only 5.6 percent were powered by diesel. The radar numbers are for 65 individual radars, while the radio, generator, and microwave information is a total for each type of system. This data will be updated as required in the future. Projected activity is expected to remain at the level of the 1995 numbers.

Table A.6-1. 1994 Nellis Range Ground Activity

1994 Nellis Range Ground Activity											
Threat Radars:	Frequency	TX Hours	**Threat Radars:**		Frequency	TX Hours		**A/G Radios:**	# of Emitters	Hours
MPS-T1				A64	I	100		GRC-171	40	29,200
S14	E/F	445			J	90		GRC-211	5	3,650
S16	I	160			E	8		GRT-21	11	8,030
S18	G	635		A66	I	103		GRT-22	34	24,820
S19	I	80			J	26				
S20	G	297			E	8		**Microwave:**	# of Emitters	Hours
S21	G	612		A67	I	138		MSF-5000	4	2,080
S22	I	213			J	5		MICOR	6	11,360
S23	I	177			E	2		MASTER II	1	520
S36	G	615		*TPT-1*				FTR 241OA	2	1,040
S37	E/F	682		U3A	H	398		TCM-6	42	213,560
S38	I	486		U3B	H	147		RHG	12	30,960
MSQ-77				U3C	J	211		RACON	8	16,640
A58	I	600		U3D	J	224		GRANGER	7	39,260
A59	I	260		U3E	J	220		MW-518	1	8,760
A60	I	400		U4A	H	117		MDR-8	16	140,160
A61	I	66		U4B	H	167		MDR-8-5N	4	35,040
A62	I	520		U4C	J	119		MVR-8G	36	229,600
MPS-9				U4D	J	117				
L89	E/F	420		U4E	J	176		**Other Emitters**		
MPS-T14				VPQ-1				Freq Band	# of Emitters	Hours
H25	E	350		A70	J	62		A	209	91,542
TPT-5 UMTE	I	2017		A71	J	16		B	121	52.998
MSQ-T43				A73	J	37		C	40	17,520
S13	I	125		A75	J	95		D	69	317,331
S30	J	33		A77	J	54		E	159	69,642
S31	J	150		A78	J	180		F	15	4,680
S32	J	102		A80	J	49		G	47	14,664
S33	J	29		A90	J	64		H	87	38,106
S34	J	21		A91	J	32		I	23	10,074
MSQ-T13				A92	J	97		J	35	10,920
S12	I	20		A93	J	48		K	2	624
	G	2		A97	J	7				
	H	20		A98	J	12				
MPQ-T3				HMU	J	25				
A63	I	1		*TPT-4*						
	I	1		U2	J	12				
	I	1								
Number of Targets		**Withdrawal Acreage**								
R4806 = 253		Total 3,050,000								
R4807 = 867		Impact Areas 23,084								
			Gallons	Gallons						
Vehicles:		Miles	Gas	Diesel						
< or = 1 Ton		12,306,293	1,156,792	73,838						
> 1 Ton		3,272,444	94,361	283,083						
Road Maint:										
Paved		298								
Gravel		188								
Dirt		327								
Road Mileage:										
Paved		344								
Unpaved		1600								
Generators:		Hours								
< or = 15 KW		35,088	17,180	38,516						
> 15 KW		129,267		478,033						
Steam				412,000						

Table A.6-2. 1995 Nellis Range Ground Activity

1995 Nellis Range Ground Activity										
Threat Radars:	Frequency	TX Hours	**Threat Radars:**		Frequency	TX Hours	**A/G Radios:**	# of Emitters	Hours
MPS-T1				A64	I	70	GRC-171 (V4)	10	24,800
S14	E/F	425			J	3	GRC-171	60	29,200
S16	I	194			E	10	GRC-211	11	3,650
S18	G	422		A66	I	41	GRT-21	12	8,030
S19	I	75			J	22	GRT-22	41	24,820
S20	G	190			E	27			
S21	G	305		A67	I	71	**Microwave:**		Hours
S22	I	283			J	7	MSF-5000	4	2,080
S23	I	270			E	1	MICOR	6	11,360
S36	G	150		A68	I	118	MASTER II	1	520
S37	E/F	120			J	6	FTR 241OA	2	1,040
S38	I	60			E	2	TCM-6	42	213,560
MSQ-77				*TPT-1*			RHG	12	30,960
A58	I	250		U3A	H	200	RACON	8	16,640
A59	I	260		U3B	H	160	GRANGER	7	39,260
A60	I	280		U3C	J	210	MW-518	2	8,760
A61	I	50		U3D	J	150	MDR-8	16	140,160
A62	I	240		U3E	J	85	MDR-8-5N	4	35,040
MPS-9				U4A	H	110	MVR-8G	36	229,600
L89	E/F	416		U4B	H	90			
MPS-T14				U4C	J	105	**~~Other Emitters~~**		
H25	E	398		U4D	J	125	Freq Band	# of Emitters	Hours
TPT-5 UMTE	I	750		U4E	J	120	A	209	91,542
MSQ-T43				*MSQ-T12*			B	121	52.998
S13	I	116		A69	J	91	C	40	17,520
S30	J	46		*VPQ-1*			D	69	317,331
S31	J	130		A70	J	28	E	159	69,642
S32	J	113		A71	J	36	F	15	4,680
S33	J	88		A73	J	47	G	47	14,664
S34	J	90		A75	J	48	H	87	38,106
MSQ-T13				A77	J	31	I	23	10,074
S12	I	53		A78	J	54	J	35	10,920
	G	7		A80	J	43	K	2	624
	H	17		A90	J	104			
S10	I	51		A91	J	34			
	G	6		A93	J	56			
	H	7		HMU	J	21			
MPQ-T3				*TPT-4*					
A63	I	55		U2	J	36			
	I	3							
	I	10							
~~Number of Targets~~			**~~Withdrawal Acreage~~**						
	R4806 = 253		Total 3,050,000						
	R4807 = 867		Impact Areas 23,084						
		Gallons	Gallons						
Vehicles:	Miles	Gas	Diesel						

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APPENDIX A.7

SENSITIVE AND AVOIDANCE LOCATIONS

ON NAFR

★Beginning at 37° 53' N, 116° 11' W
to 37° 58' N, 115° 00' W
to 37° 34' N, 115° 00' W
to 37° 34' N, 115° 53' W
to 37° 42' N, 115° 53' W
to 37° 42' N, 116° 11' W
to 37° 53' N, 116° 11' W
to the point of beginning.

*1.2.4.2.5. Sally Area:

• Coordinates:

★Beginning at 37° 17' N, 115° 11' W
to 37° 17' N, 114° 51' W
to 36° 43' N, 114° 51' W
to 36° 43' N, 115° 03' W
to 36° 26' N, 115° 18' W
to 36° 38' N, 115° 18' W
to 36° 48' N, 115° 07' W
to 37° 13' N, 115° 07' W
to the point of beginning.

*• Description. Sally (9,700 ft MSL to infinity) is the Nellis AFB transition route to the northern training areas. Nellis Control provides positive control to aircraft using the corridor.

1.2.4.2.6. Cedar ATCAA:

• Coordinates:

*Beginning at 38° 00' N, 114° 34' 30" W
to 38° 01' N, 114° 30' W
to 38° 01' N, 114° 12' 00" W
to 37° 53' N, 113° 39' 00" W
to 37° 43' N, 113° 48' 00" W
to the point of beginning.

• Description. Cedar airspace (100 ft AGL to infinity). Aircrews must be aware that Cedar may be recalled at any time. When recalled, a vertical limit will be specified.

*1.2.4.2.7. Desert National Wildlife Range. (See paragraph 1.30.).

*1.2.4.2.8. R-4808N (Includes R-4808W/R-4808E):

• Coordinates:

*Beginning at 36° 41' N, 115° 56' W
to 36° 41' N, 116° 15' W
to 36° 46' N, 116° 27' W
to 36° 51' N, 116° 27' W
to 36°51' N 116° 34' W
to 37° 16' N 116° 34' W
to 37° 16' N 116° 00' W
to 37° 28' N 116° 00' W
to 37° 28' N 115° 35' W
to 37° 06' N 115° 35' W
to 37° 06' N 115° 56' W
to the point of beginning.

*1.2.4.2.9. R-4808W

• Coordinates: Reference paragraph 1.29.2

• Restrictions. Overflight of R-4808W is restricted to aircraft following locally published departure and recovery routes, emergencies, or missions scheduled within the Nevada Test Site. Do not overfly R-4808W below 15,000 ft MSL. See paragraph 1.29.3 for further restrictions.

1.3. Supersonic Training Area:

1.3.1. Supersonic flight is approved within designated areas based on the requirement for realistic testing and training. Conduct supersonic flight only when necessary to accomplish the mission. Log all supersonic activity on AF Form 121, Sonic Boom Log. Forward a copy of AF Form 121 to AWC/SER when requested. Pilots should avoid populated portions of the area to minimize public reaction. Specific designated areas and their associated restrictions are:

1.3.1.1. Supersonic overflight is authorized in the following areas of the Desert MOA, ATCAAs and R-4806E from 5,000 AGL to infinity:

1.3.1.1.1. Alamo or R-4806E - North of the 36° 43' N latitude.

1.3.1.1.2. Caliente - West of the 114° 35' W longitude.

1.3.1.1.3. Coyote - All.

*1.3.1.1.4. Sally - North of the 36° 52' N latitude.

1.3.1.1.5. Elgin - North of a line from 36° 52' N, 114° 50' 43" W to 37° 04' N, 114° 33' W to 37° 04' N, 114° 20' W.

1.3.1.2. In Reveille from 5,000 ft AGL to the highest altitude scheduled.

1.3.1.3. In R-4806W above 5,000 ft AGL to unlimited.

1.3.1.4. In R-4807A above 500 ft AGL minimum overflight to unlimited.

1.3.1.5. Supersonic flight is not authorized:

1.3.1.5.1. Below 5,000 ft AGL in the boundaries of Tolicha Peak EC Range.

1.3.1.5.2. Below 5,000 ft AGL in Electronic Combat East (ECE), Cactus ECR, and EC South (ECS).

1.3.1.5.3. Within the boundaries of R-4807B (Pahute Mesa).

*1.3.2. Subsonic flight is authorized in R-4809. This includes EC West. Supersonic flight may be approved after coordination with Sandia Corporation through 99 RANS/DOOS on a case-by-case basis. Once approved, supersonic flight will only be conducted above 5,000 ft AGL. Other flight restrictions may apply and will be passed at the time of approval.

Section C - Manned Bombing Ranges.

1.4. Overview:

1.4.1. Ranges 63 and 65, located within R-4806W, can be controlled from the South Range Blockhouse (call sign Fatness 63) or from each main tower. Both ranges contain numerous Television Ordnance Scoring System (TOSS) and Time-Space-Position-Information (TSPI) scoreable targets. Fatness 63 must coordinate all range activity to protect ground parties from inadvertent deliveries. Aircrews will establish a two-way radio contact with the appropriate range control tower, call sign Fatness 63 for Range 63 and Fatness 65, for Range 65 and receive specific clearance for the intended target prior to releasing any ordnance. Fatness 63 can give clearance to expend on Range 65 when Range 65 is used as a Class B range.

1.4.2. Range Control Officer (RCO) requirements are determined by range classification and target:

1.4.2.1. Range 63 is a Class A or B range. Refer to AFI 13-212, Volume 1/NAFB Supplement 1 to determine RCO requirements.

1.4.3. Range 63 is primarily used for Operational Testing and Evaluation (OT&E) missions and night conventional weapons training and as a backup day conventional weapons delivery range. Range 63 will not normally be used for tactics training when ordnance delivery is planned. Range 65 is used primarily for day conventional weapons delivery training.

1.4.4. Aircrews using Ranges 63 and 65 may not penetrate Indian Springs Air Force Auxiliary Field (Indian Springs AFAF) airport traffic area below 6,133 ft MSL (3,000 ft AGL) without prior authorization from the Indian Springs tower. Aircrews must check NOTAMS to confirm the status of the Thunderbird extensive training area.

*1.4.5. Both Ranges 63 and 65 lie within the Desert National Wildlife Range. Restrictions in paragraph 1.30. apply.

*1.4.6. The 57th Operations Group Commander (57 OG/CC) or equivalent may request waivers to these guidelines through 99 RANS/CC and AWC/SER.

1.5. Range 63:

1.5.1. Description. Located in the southern portion of R-4806W, 31 NM northwest of Nellis AFB, Range 63 is the primary OT&E range for the NRC. It can accommodate live or inert, conventional, and nuclear training air-to-ground deliveries with TOSS scoring and Kineto Tracking Mounts (KTMs). The manned range is a three-towered range. The east tower and west tower are 5,896 ft and 5,895 ft. respectively from the center tower. Range 63 contains two subareas; Range 63A and 63B. Both ranges are normally reserved for use by the Air Command Combat Arms School (ACCAS). Both ranges are small arms live-fire training facilities. Aircrews will not overfly Range 63A or Range 63B below 18,000 ft MSL when the respective range is scheduled "hot".

ground parties endanger vehicles along the Alamo road.

*1.34.3. Northern Range:

*1.34.3.1. Hunters will be allowed access in R-76 airspace west of 117° 01' 00" W and of the portion north of 37° 26' 00" N.

*1.34.3.2. Minimum flight altitude, is 10,000 ft MSL.

*1.34.3.3. Ground parties will be below subject airspace.

*1.34.4. For both ranges:

*1.34.4.1. Do not release ordnance.

*1.34.4.2. Ground parties, except hunters and EOD, TOSS and the O&M contractors are restricted to allow hunters full access. Nonessential access will be limited to the valley floors below the 4,000 ft contour line nor will ground parties endanger vehicles along the Alamo road.

*1.34.4.3. Verify restrictions published in daily range schedule.

1.34.2. During the Bighorn Sheep hunt, accomplish emergency jettison on Range 63 with Blackjack approval and under Fatness 63 control. Expect Fatness 63 to direct jettison on Target 63-4 (south grid).

***1.35. Use of Public Lands.** Use of public lands outside those designated as the Nellis Air Force Range (NAFR) under Public Law 99-606 (reference the Federal Register, Vol 52, No. 16, Monday, 26 Jan 91, page 2773, and the Federal Register, Vol 53, No. 189, Thursday, 29 Sep 88, page 38099, or refer to the dotted line showing the NAFR boundary on the Nellis range chart):

*1.35.1. The 99th Civil Engineering Squadron (99 CES/CERR) establishes all right-of-ways, casual use agreements, leases, and permits related to real property. Those in force are:

*1.35.1.1. Landing Zones:

*1.35.1.1.1. Texas Lake (Delamar Airstrip). Use on hold. Use is in work with AWC/EV and 99 CES/CERR; currently closed to operations.

*1.35.1.2. Drop Zones:

*1.35.1.2.1. In the BLM Tonopah Resource Area: ROW N49649 - Pipeline, Boxcar, and Rock.

*1.35.1.2.2. In the BLM Caliente Resource Area: ROW R49861 - 364, 355, Macomb, Judy, King, Delamar Lake, 4871, Jenkins, Delamar, Famar, Delamar East, 307, Macomb, Husch 308.

1.35.1.3. Auxiliary Fire Sites (AFS) for SAM/Patriot Ops in the Tonopah Resource Area: ROW N50838 - Hawk AFS, West Hawk AFS, North Patriot AFS, and Patriot AFS.

1.35.1.4. For the use of County Airstrips/Airports in Southern Nevada coordinate:

1.35.1.4.1. With Lincoln County for: Pioche, Caliente, Delamar; Alamo.

1.35.1.4.2. With Nye County for: Beatty, Lease, #DACA 09-5-89-3; Tonopah Municipal, Lease, #DACA 09-5-89-5.

1.35.2. Use of public or private lands below MOAs and/or outside the NAFR land withdrawal require specified steps listed below:

1.35.2.1. Establishment of lease, right-of-way, casual use agreement, or permit through 99 CES/CERR, Real Property Office.

1.35.2.2. Notification of BLM when using public lands, per the terms and conditions of the subject agreement or compliance with lease agreement on private lands or public airstrips.

1.35.2.3. Notification of local/county law enforcement to prevent confusion with smuggling operations when generating aircraft landings or takeoffs. Local law enforcement will inform the Drug Enforcement Agency, if necessary.

*1.35.3. Users of drop zones, landing zones, and county airstrips should consult 414 CTS (Red Flag) before upcoming operations. BLM requires advance notice in order to notify other users of public lands, unless emergency conditions prevail (i.e., SAR or Plan 6 activity).

*1.35.4. Notification is usually given two weeks in advance. (Suggest statement to transfer operational control to Red Flag):

1.35.4.1. Notify 414 CTS/DOM for light aircraft operations, to include helicopters, and fighter aircraft use.

1.35.4.2. Notify 414 CTS/AMCLO for medium aircraft operations. (Those aircraft normally controlled by HQ AMC).

1.35.5. Sensitive and no-fly areas: The following is a list, (by Range/MOA) of sensitive and no-fly areas:

Range/ MOA	Site Name	Coordinates	Restrictions
R63	Corn Creek Station	36° 26' 00" N 115° 22' 00" W	2NM radius, 8,000' MSL
R65	Town of Indian Springs	36° 34' 50" N 115° 40' 30" W	1NM radius, 500' AGL
R63	Alpha		(See para 2-5) Do not overfly below 18,000 feet MSL when the range is scheduled hot.
	Bravo		Do not overfly below 18,000 feet MSL when the range is scheduled hot.

Range/ MOA	Site Name	Coordinates	Restrictions
EC West	RF Emitter	37° 41' 06" N 116° 25' 10" W AGL	0.5NM radius, 2,000'
Reveille	Adaven	38° 08' 00" N 115° 36' 00" W AGL	1.5NM radius, 1,500'
	Carter Ranch	38° 03' 30" N 115° 38' 00" W AGL	3 NM radius, 3,000'
	Town of Reveille	38° 02' 00" N 116° 10' 10" W AGL	1.5NM radius, 1,500'
Alamo	Alamo	37° 22' 00" N 115° 10' 00" W AGL	1.5NM radius, 1,500'
*Caliente	Caliente	37° 36' 50" N 114° 31' 20" W MSL	5NM radius, 20,000' MSL
	Lincoln	37° 47' 15" N 114° 25' 18" W	3NM radius, 1,500'AGL
	Pioche	37° 56' 00" N 114° 27' 10" W	1NM radius, 1,000' AGL
	Pioche Airport	38° 00' 50" N 114° 31' 00" W	3NM radius, 1,500' AGL
Coyote	Hiko	37° 36' 00" N 115° 13' 30" W	1.5NM radius, 1,500' AGL

	Pahranangat Wildlife Refuge	37° 12' 00" N 115° 03' 00" W 37° 19' 00" N	1NM radius, east and west around line, 2,000' AGL
	Key Pitman Wildlife Management	115° 08' 00" W 37° 32' 00" N 115° 14' 00" W 37° 36' 00" N 115° 13' 00" W	NM east and west of line. N 2,000' AGL
	Rachel	37° 42' 00".N 115° 50' 00" W 37° 42' 00" N 115° 41' 18" W to the tangent of a circle with a 1.5NM radius drawn around a point at 37° 39' 00" N 15° 38' 00" W then to 37° 38' 00" N 115° 42' 42" W 37° 37' 06" N 115° 50' 24" W 37° 38' 42" N 115° 53' 12" W 37° 40' 42" N 115° 53' 12" W	Overflight 1,500' AGL and above subsonic, 5,000' AGL and above supersonic
Elgin	Elgin	37° 21' 00" N 114° 32' 00" W	1.5NM radius, 1,500' AGL
	★Brookshire Farm	36° 50' 24" N 114° 39' 24" W	3.0 NM radius, 1500' AGL
Range/ MOA	Site Name	Coordinates	Restrictions
*Sally	Desert National Wildlife Range	36° 48' 00" N 115° 07' 00" W 36° 38' 00" N 115° 18' 00" W 36° 26' 00" N 115° 18' 00" W 36° 38' 30" N 115° 07' 00" W	2,000' AGL
Off-range	Beatty airport	36° 52' 00" N 116° 47' 00" W	3NM radius, 3,000' AGL
	Calvada Meadows Airport	36° 16' 00" N 116° 00' 00" W	1.5NM radius, 1,500' AGL
	Amargosa Valley	36° 25' 30" N 116° 23' 30" W 36° 25' 10" N 116° 24' 45" W 36° 27' 30" N 116° 26' 30" W 36° 30' 30" N 116° 29' 00" W	0.5NM radius, 500' AGL. Fly above 500' AGL on VR-1225 and IR-286 when 116° 15' W and 116° 38' W.

		36° 31' 15" N 116° 25' 45" W 36° 34' 15" N 116° 28' 00" W 36° 18' 00" N 116° 40' 30" W	
	Ash Meadows Wildlife Refuge	36° 28' 00" N 116° 21' 00" W 36° 21' 00" N 116° 15' 00" W	2NM east and west around line, 2,000' AGL
	Bell Residence	36° 32' 20" N 116° 27' 30" W	1NM radius, 1,000' AGL
	Glendale	36° 39' 50" N 114° 34' 05" W	1NM radius, 1,000' AGL
	Goldbar Mine	36° 56' 00" N 116° 53' 00" W	1NM radius, 1,000' AGL
	Goldfield	37° 42' 30" N 117° 14' 00" W	3NM radius, 2,000' AGL
	Lathrop Wells	36° 38' 30" N 116° 24' 00" W	2NM radius, 1,500' AGL
	Logandale	36° 36' 00" N 114° 29' 00" W	1NM radius, 1,000' AGL
	Moapa	36° 40' 30" N 114° 37' 30" W	1NM radius, 1,000' AGL
	Spicer Residence	36° 58' 54" N 116° 43' 12" W	2NM radius, 1,500' AGL
	Mt Potosi	36° 00' 00" N 115° 30' 00" W	2NM radius, 2,000' AGL
	Nellis AFB Area II	3NM northeast of Nellis	No overflight
	Overton	36° 32' 30" N 114° 27' 00" W	1NM radius, 1,000' AGL
Range/ MOA	Site Name	Coordinates	Restrictions
	Rhyolite	36° 54' 30" N 116° 49' 50" W	1NM radius, 1,000' AGL
	Smith Ranch	36° 17' 00" N 116° 05' 20" W	1NM radius, 1,000' AGL
	Tonopah	38° 04' 20" N 117° 14' 00" W	1NM radius, 1,000' AGL
	Tule Springs	36° 19' 00" N 115° 16' 00" W	1.5NM radius, 1,500' AGL

*Coordinates. (See para 1.32.3):

DROP ZONE	Coordinates (WGS-72)			
Antelope	37° 48' 12" N	116° 25' 16" W	/	11SNM50948394
Black Mountain	37° 18' 18" N	116° 06' 54" W	/	11SNM34202920
Boxcar	37° 44' 47" N	116° 05' 44" W	/	11SNM79647794
Coin	37° 47' 39" N	116° 17' 06" W	/	11SNM62818291
FAC Alpha	37° 21' 12" N	116° 47' 00" W	/	11SNM33851955
Keno	37° 45' 32" N	116° 14' 50" W	/	11SNM66457879
L'Amour	37° 48' 00" N	116° 24' 33" W	/	11SNM52108491

Mellan	37° 41' 00" N	116° 37' 33" W	/	11SNM33087055
Pinnacle	37° 50' 34" N	116° 26' 52" W	/	11SNM48418790
Pipeline	37° 44' 09" N	116° 09' 10" W	/	11SNM74997682
Poker	37° 42' 53" N	116° 17' 58" W	/	11SNM61717473
Prospect	37° 51' 34" N	116° 28' 22" W	/	11SNM46349003
Rebel	37° 47' 39" N	116° 17' 06" W	/	11SNM63048302
Ricardo	37° 21' 24" N	116° 43' 24" W	/	11SNM23953395
Rock	37° 44' 02" N	116° 04' 14" W	/	11SNM82177635
Sand	37° 48' 02" N	116° 03' 19" W	/	11SNM83458411
Sumner Spring	37° 46' 21" N	116° 17' 25" W	/	11SNM62478041
Texas Lake	37° 19' 50" N	114° 56' 10" W	/	11SPM82933334
Token	37° 46' 29" N	116° 22' 13" W	/	11SNM5998082
Tres Burros	37° 10' 36" N	116° 49' 00" W	/	11SNM16601385
Wild Horse	37° 47' 21" N	116° 23' 41" W	/	11SNM53258283

Chapter 2

WEAPONS EMPLOYMENT PROCEDURES

*2.1. **Overview.** The procedures outlined in this chapter apply to all aircrews and ground personnel using the NRC. Range users must closely monitor the 99 RANS daily flying schedule for ordnance delivery restrictions such as ground party overflight restrictions and chaff and flare release restrictions:

2.1.1. A member of the flight will contact Blackjack prior to or upon entering the range complex and confirm ordnance being carried. Confirm with Blackjack the range targets they wish to drop on, the number and type of ordnance, including live training and inert.

2.1.2. The master armament switch will be in the SAFE/SIM position when aircraft are not on the range of intended employment. For a combined load of captive, training, inert or live ordnance, aircrews will not select armament switches that could possibly induce the inadvertent release of any ordnance prior to range entry. Captive training ordnance may be selected at any time. Avoid overflying populated areas. Aircraft with externally loaded ordnance will accomplish an ordnance check before exiting the range complex. Fly a hung ordnance pattern if ordnance status cannot be positively verified.

2.1.3. All targets must be positively identified prior to weapons release.

**WARNING:* Some manned and unmanned site support vehicles are painted white to distinguish them from targets. Do not expend ordnance against anything painted white. Manned sites have strobes in the daytime and steady white lights at night. Unmanned sites also have strobes for FLIR distinguishing such as IR tank generators.

2.2. Ordnance Categories:

2.2.1. Training Ordnance:

2.2.1.1. TP or TPT ammunition.

2.2.1.2. Rockets with inert warheads.

2.2.1.3. BDU-33, BDU-48, BDU-50, and MK-106 practice bombs.

2.2.1.4. Captive air-to-ground training missiles without motors including TGM-45/65/88s.

2.2.1.5. Air-to-air captive training missiles.

2.2.2. Inert ordnance. General Purpose (GP) bombs, Guided Bomb Units (GBUs), and Cluster Bomb Units (CBUs) without live explosives or fuses. Also included are BDU-8/12/38 bombs.

2.2.3. Live ordnance:

*2.2.3.1. AP/API and HE/HEU. Depleted Uranium (DU) ammunition authorized for special test only.

2.2.3.2. Rockets with live warheads including White Phosphorous (WP).

APPENDIX A.8

NO-ACTION SCENARIO

(REDUCTIONS IN FORCE ASSUMPTIONS)

Appendix A.8 No-Action Reduction in Force Assumptions (as of 1 Jan 98)	
Nellis AFB Unit	*Assumed % Reduction*
Air Warfare Center	50%
USAF Air Demonstration Squadron	0%
547 Intelligence Squadron	50%
66 Rescue Squadron	100%
57 Logistics Group	50%
57 Operations Group	50%
57 Logistic Support Squadron	50%
57 Operations Support Squadron	50%
57 Wing	50%
57 Equipment Maintenance Squadron	50%
USAF Weapons School	75%
11 Reconnaissance Squadron	100%
422 Test & Evaluation Squadron	100%
57 Aircraft Generation Squadron	50%
57 Component Repair Squadron	50 %
414 Combat Training Squadron	100%
57 Wing — Detachment 0	50%
57 Training Support Squadron	75%
549 Combat Training Squadron	0%
99 Mission Support Squadron	50%
99 Comptroller Squadron	50%
99 Security Police Operations	50%
99 Civil Engineering Squadron	50%
99 Medical Group	0 %
99 Supply Squadron	50 %
99 Security Support	50 %
99 Transportation Squadron	50 %
99 Communications Squadron	50 %
99 Security Police Squadron	50 %
99 Contracting Squadron	50 %
99 Ground Combat Training	100 %
99 Medical Operations Squadron	50 %
99 Aerospace Medicine Squadron	50 %
99 Medical Support Squadron	50 %
99 Range Squadron — Detachment 0	100 %
99 Air Base Wing	50 %
99 Logistics Group	50 %
99 Range Squadron	100 %
99 Range Support Squadron	100 %
99 Services	50 %
99 Security Police	50 %

APPENDIX A.9

THE ANALYSIS OF HISTORICAL AIRCRAFT SORTIE DATA AND THE PROJECTION OF A RANGE OF FUTURE AIRCRAFT OPERATIONS AT THE NELLIS RANGE COMPLEX

APPENDIX A.9

THE ANALYSIS OF HISTORICAL AIRCRAFT SORTIE DATA AND THE PROJECTION OF A RANGE OF FUTURE AIRCRAFT OPERATIONS AT THE NELLIS RANGE COMPLEX

1.0 INTRODUCTION

Aircraft operations over the NAFR and within the NRC have historically varied, depending on many factors including international events, congressional funding, training needs, and operational test and evaluation requirements. It is anticipated that future aircraft operations would be expected to vary in response to this wide range of factors. Various organizations within the Air Force also maintain independent records of aircraft operations within the NRC to support their needs and requirements. The Air Force conducted a detailed, comprehensive review of aircraft operations within the NRC from 1991 through 1995 (the 2001 Utilization Study) to support this LEIS.

An independent evaluation of the various records of aircraft operation within the NRC covering annual operations outside of the years covered by the 2001 Utilization Study was completed in order to support the LEIS and to develop a basis for projections of annual sorties by aircraft by airspace subdivision. This analysis summarizes this evaluation and includes descriptions of the data reviewed, a display of the data collected and analyzed, a process for normalizing the available data, a methodology for distributing aircraft sorties over the NRC, and a projection of the range of yearly NRC aircraft operations (for a projected low-use year and a high-use year).

2.0 REVIEW OF EXISTING SORTIE DATA

Several different sources of aircraft sortie data were collected and reviewed in an effort to establish a consistent summary of Nellis Range Complex (NRC) use since 1983. Because of administrative limitations on how long operational records are maintained, it was necessary to examine both historical records from various Air Force organizations and environmental reports for documentation on past NRC use. Table 1 summarizes the sortie data from several sources.

Since the existing sortie data were collected for the specific purposes of the individual organizations, there are differences and inconsistencies among the various data sets. Differences between the data sets can be attributed to the following:

- Specific purposes and requirements of the tracking organization can lead to different methods of sortie counting. For example, data shown in Table 1 under “Other Sources” (obtained from past environmental assessments and from 57th FW operational data) reflect the number of complex-wide range sortie missions, for which one mission into the NRC is counted as one sortie, rather than counting each operation within each NRC

airspace subdivision. For the other organizations identified in Table 1, the sorties were counted once for *each* of the airspace subdivisions flown during a single mission into the NRC. This difference in methodology accounts for the higher numbers shown for the 2001 Utilization Study, Range Group Scheduling, the HQ-AFSA/XATF RAPCON records and the 99th OSG History. (Range Group Scheduling is also the source of the 99th OSG history records.)

- Some data sets are reported by calendar year (CY) while others are reported by fiscal year (FY), as indicated in the table. This fact can account for significant differences in yearly totals if a Red Flag, other large force exercises or changes in operations tempo occurred during the October-December quarter.

- Aircraft realignments, unit activation/deactivations, reductions in force and flying hours, budget constraints, and other such actions since the late 1980s have affected the number and type of aircraft using the NRC. The number of Flag exercises and participants has declined in recent years. Deactivation of the 474th TFW resulted in removal of 66 F-16s from Nellis. Other realignments included beddown of 5 F-15Es, conversion from 20 F-5s to 18 F-16s, relocation of F-117s to Holloman AFB, and relocation of F-4Gs to Nellis and their subsequent deactivation. The TAC and SAC merger, use of more precision guided weapons, and other considerations have also changed the composition of mission packages.

- The number of subdivisions tracked may vary depending upon the organization (e.g., Range Group Scheduling). Further, since airspace subdivisions may be established or disbanded at the convenience of the Air Force (i.e., without formal coordination with the FAA or other agencies) the number and location of internal boundaries of subdivisions may change over time.

- The years for which sortie data were available differed among the various data sources.

Because of the above differences, the 2001 Utilization Study and the Range Group Scheduling data sets were found to be the only sources sufficiently consistent and comprehensive for estimating NRC airspace use for the purposes of the LEIS. However, there are several differences in how these two sources accounted for the NRC sorties:

- The 2001 Utilization Study data were prepared as a special effort for calendar years 1991-1995 and were based on extensive research of different range data sources and organizational records to determine sorties flown by aircraft type. The data accounted for 21 NRC airspace subdivisions that included the north and south range areas, 4 MOA sectors, as well as Pahute Mesa, R-4808 E, R-4808 W, and R-4809A. Sorties were counted once for each of the airspace subdivisions flown during a range mission. An estimate of the number of subdivisions flown during a Red Flag mission was made in the study. Red Flag factors of zero, one, five or ten were applied for each Red Flag

participant depending upon aircraft type. No distribution of sorties by airspace subdivision was made for Red Flag participants. This study also included estimates of civil/contract aircraft (B-737 and small prop) that transit NRC airspace. Some specific details on how the 2001 Utilization Study data were assembled are not available, but information from the other sources helped to validate the general reliability of the 2001 Utilization Study data. Table 2 summarizes the 2001 Utilization Study data. The complete 2001 Utilization Study data tables are presented in Tables 8 through 12.

- The Range Group Scheduling office tracked and reported use of the NRC by accounting for *actual* sorties flown by organization by fiscal year within 17 of the 21 airspace subdivisions prior to October 1996. (No aircraft type data was available.) The four airspace subdivisions (Pahute Mesa, R-4808E, R-4808W, and R-4809A) were not tracked until October 1996. Starting in August 1997, the Range Group Scheduling Office tracked R-4808E and R-4808W as one subdivision. Flying organizations provide daily updates to the office that reflect sorties flown during the previous day's range schedule. While these data are reliable, they only track military test and training sorties and do not include civil/commercial flights. Further, Red Flag and Green Flag organizations list extensive use of 11 to 14 airspace subdivisions and moderate annual use of up to four additional subdivisions from 1995 through 1997 (see Tables 13, 23, and 36). An additional data anomaly to be considered is the lack of data for August, September, and October 1995 and the omission of this data from the FY95 and FY96 totals, which results in the total for CY 1995 being significantly lower than other years. Table 3 present Range Group Scheduling data by calendar year for 1995 through 1997. Following "normalization" of assumptions (to account for the differences in the subdivisions and aircraft types covered) this data would correspond with 2001 Utilization Study calendar year data. (Data for years before 1995 were no longer on file.)

The Range Scheduling data for 1995 through 1997 are organized by military organization and are used to document how airspace subdivisions were used by each organization. Once an aircraft leaves Nellis AFB-controlled airspace, Range Scheduling charges the organization for airspace subdivisions reserved. The airspace subdivisions are then recorded. If an aircraft actually uses fewer subdivisions, the change is not registered in Range records. This could explain why the 2001 Utilization Study elected to use what constitutes an average of 10 airspace subdivisions for most large force exercise aircraft. (Range Scheduling lists 11-14 sortie-operations for airspace subdivisions with heavy use and up to 18 subdivisions affected per Flag aircraft.) Breakout by aircraft types by airspace subdivision is not provided by Range Scheduling. The type of aircraft flown per organization is not readily available from historical records. This is especially the case where the "organization" is Red Flag.

3.0 NORMALIZED RESULTS

No single data source or combination of sources currently available contain sufficient detail to comprehensively construct an accurate accounting of past NRC use by aircraft type and by airspace subdivision as presented in the 2001 Utilization Study. This is primarily due to the

administrative limitations on the length of time records are maintained and because tracking requirements by any one organization do not fully account for all range users by aircraft type and by airspace subdivision. In addition, it is not likely that previous data needs or requests had required the compilation of range use data as was accomplished for the 2001 Utilization Study.

In an effort to evaluate the most recent NRC use data (for 1995 through 1997), the Range Group Scheduling monthly data were normalized so that the data could be compared with data in the 2001 Utilization Study. The results are presented in Table 4.

The normalization procedure involved the following adjustments:

For CY 95:

- Data were not available for August, September and October. The data for the rest of the year was presumed to be representative for these three months. The annual total was therefore prorated based on the nine months of available data.

- Data for subdivisions R-4808 E, R-4808-W and R-4809 and Pahute Mesa were not available. An estimate of the military sorties for these subdivisions was calculated by averaging the sorties for these subdivisions for CY96 and CY97.

- Civilian and commercial flights were estimated from the 2001 Utilization Study (average of 5 years) to be 19,161 per year.

For CY 96:

- Data for subdivisions R-4808 E, R-4808-W and R-4809 and Pahute Mesa were prorated from three months to a full year. Since there were three Red Flag exercises during the year, this proration was reduced by the number of Red Flag sorties associated with these subdivisions for one Red Flag exercise (approximately 7,860 sorties).

- Civilian and commercial flights were estimated from the 2001 Utilization Study (average of 5 years) to be 19,161 per year.

For CY 97:

- Civilian and commercial flights were estimated from the 2001 Utilization Study (average of 5 years) to be 19,161 per year.

4.0 PROJECTIONS OF FUTURE AIRCRAFT OPERATIONS AND DISTRIBUTION METHODOLOGY

Based primarily on an examination of the 2001 Utilization Study data and the Range Group Scheduling office data, a range of from 200,000 to 300,000 subdivision sorties per year, including

Flag operations, is considered a reasonable, bracketing range of sorties for the purposes of this LEIS.

A method was developed for creating a distribution of aircraft over the 21 airspace subdivisions of the NRC. This distribution then permits calculating the number of sorties by aircraft type by airspace subdivision for a given total number of sorties. The procedure is as follows:

- As a starting point, the CY 95 distribution from the 2001 Utilization Study was used because it represents the most complete data set available for the numbers of sorties by aircraft type and by airspace subdivision. (As depicted inTable 12, an annual total of 230,573 sorties were identified in this study.)
- Because of the retirement of certain aircraft types, a revised table was created in which the F-111 sorties were added to the F-15 sorties to simulate the replacement of F-111s by F-15Es. Likewise the F-4 sorties were added to the F-16 sorties as the transfer of the SEAD mission of F-4s was moved to F-16s.
- Ratios of the number of each aircraft type in each airspace subdivision to the total number of sorties were calculated.
- For the Red Flag aircraft, for which no airspace subdivision use by aircraft type data was provided in the 2001 Utilization Study, a distribution was developed for each aircraft type depending upon its Red Flag factor given in the 2001 Utilization Study (see Table 5). As above, ratios of the number of each Red Flag aircraft type in each airspace subdivision were calculated.
- The above distributions was then applied to the total numbers of non-Red Flag and Red Flag aircraft separately to produce tables of aircraft type by airspace subdivision.
- The non-Red Flag and Red Flag sortie distributions tables are then added to form the combined sortie distribution table for a given total number of sorties.

The application of the above distribution methodology for these low and high limits result in Tables 6 and 7, respectively. These tables present the calendar year number of sorties into each airspace subdivision by aircraft type, using the modified CY 95 distribution based on 2001 Utilization Study data.

Table 1. Summary of Annual NRC Sortie Data 1983-1997

Year	*2001 Utilization Study*	*Range Group Scheduling*	*Air Traffic Activity HQ AFSA/XATF RAPCON*	*99th OSG History Records*	*Other Sources*
1983					65,866 FY(1)
1984					71,122 FY(1)
1985					69,524 FY(1)
1986				200,089 CY	69,279 FY(1)
1987			360,758 CY		69,771 FY(1) 241,019 FY(2)
1988			319,741 CY	199,734 FY	196,824 FY(2)
1989			334,449 CY	259,289 FY	
1990			311,258 CY	208,424 CY	
1991	*268,511 CY	251,808 FY	248,893 CY	(same as Range Scheduling data)	
1992	*236,905 CY	259,185 FY	255,106 CY	"	
1993	*239,682 CY	213,413 FY	240,402 CY	"	
1994	*222,627 CY	198,490 FY		"	*64,993 CY(3)
1995	*230,573 CY	**181,014 FY	242,116 CY	"	*61,165 CY(3)
1996		***186,233 FY	207,293 CY	"	*66,843 CY(3)
1997		****255,025 FY			*24,419 CY(3)

Notes: 1. Final Environmental Assessment, R-4807 Expansion, May 1989

2. 1989 Airspace Management Briefing

3. Sortie data provided by 57th FW Operations (Complex wide)

* Data set is available by aircraft type.

** Partial fiscal year – data were not available for August and September 1995.

*** Partial fiscal year – data were not available for October 1995.

**** Range Scheduling began tracking four additional subdivisions (Pahute Mesa, R-4808 E&W, and R4809A)

Table 2. NRC Sortie Data CY91-95 by Subdivision — 2001 Utilization Study

Subdivision	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
Desert MOA						
Caliente	12,782	11,969	14,110	14,120	11,372	12,871
Coyote	7,789	7,933	8,039	7,837	6,292	7,578
Elgin	13,862	10,610	11,350	10,023	8,775	10,924
Reveille MOA	8,106	8,133	7,577	7,583	6,060	7,492
R 4806						
R61	4,105	3,740	4,911	3,704	3,660	4,024
R62	5,504	5,194	6,383	5,195	5,281	5,511
R63	4,430	4,280	6,491	5,487	5,538	5,245
R64	7,474	7,149	8,531	6,687	6,718	7,312
R65	7,113	6,019	7,858	6,448	6,814	6,850
Alamo	4,685	4,380	5,415	4,742	4,294	4,703
R 4807						
EC South	7,744	5,311	5,686	4,771	6,478	5,998
Pahute Mesa	5,983	5,470	5,287	5,063	5,981	5,557
R71	8,464	5,493	4,687	4,499	6,953	6,019
R74	7,314	6,886	6,649	6,572	9,583	7,401
R75	7,648	6,853	6,240	6,044	9,977	7,352
R76	10,922	8,950	7,751	6,617	8,247	8,497
R 4808						
R4808E	4,988	4,987	5,126	4,328	4,910	4,868
R4808W	5,961	5,438	5,965	5,420	6,400	5,837
R4809A	2,321	2,321	2,321	1,821	2,905	2,338
EC East	6,826	5,503	5,712	6,308	6,479	6,166
EC West	9,509	7,179	7,849	7,379	7,536	7,890
Subtotal[1]	153,530	133,798	143,938	130,648	140,253	140,433
Red Flag Total	114,981	103,107	95,744	91,979	90,320	99,226
Grand Total	**268,511**	**236,905**	**239,682**	**222,627**	**230,573**	**239,660**

Note: 1. Subtotal of sorties in the above subdivisions.

Table 3. NRC Sortie Data CY95-97 by Subdivision -- Range Group Scheduling

Subdivision	*Partial CY 95*[1]	*Partial CY 96*[2]	*CY 97*
Desert MOA			
Caliente	15,978	21,841	18,221
Coyote	13,642	17,890	13,882
Elgin	13,480	20,066	14,534
Reveille MOA	13,444	17,265	13,734
R 4806			
R61	3,701	4,537	4,266
R62	3,108	4,809	4,357
R63	3,227	4,930	4,160
R64	3,079	4,640	4,223
R65	4,092	5,936	5,179
Alamo	4,075	5,378	4,275
R 4807			
R71	12,843	16,955	13,460
R74	13,131	17,492	13,610
R75	13,367	17,591	13,490
R76	13,060	17,326	13,644
EC South	12,788	17,067	13,556
Pahute Mesa[2]		5,157	13,157
R 4808			
R4808E[2]		479	5,804
R4808W[2]		5,145	8,208
R4809A[2]		4,721	12,863
EC East	13,312	17,577	13,590
EC West	13,242	17,446	13,520
Total	**169,569**	**244,248**	**221,733**

Notes: 1. Partial CY 95 Data not available for August, September and October.

2. Partial CY 96 Data collected in October, November & December only for R4808E, R4808W, Pahute Mesa, R4809A

Table 4. Normalized NRC Monthly Sortie Data CY95-97 by Subdivision — Range Group Scheduling

Subdivision	*1995*[1]	*1996*[2]	*1997*[3]	*Average*
Desert MOA				
Caliente	15,978	21,841	18,221	
Coyote	13,642	17,890	13,882	
Elgin	13,480	20,066	14,534	
Reveille MOA	13,444	17,265	13,734	
R 4806				
R61	3,701	4,537	4,266	
R62	3,108	4,809	4,357	
R63	3,227	4,930	4,160	
R64	3,079	4,640	4,223	
R65	4,092	5,936	5,179	
Alamo	4,075	5,378	4,275	
R 4807				
R71	12,843	16,955	13,460	
R74	13,131	17,492	13,610	
R75	13,367	17,591	13,490	
R76	13,060	17,326	13,644	
EC South	12,788	17,067	13,556	
Pahute Mesa	0	5,157	13,157	
R 4808				
R4808E	0	479	5,804	
R4808W	0	5,145	8,208	
R4809A	0	4,721	12,863	
EC East	13,312	17,577	13,590	
EC West	13,242	17,446	13,520	
MOAs, 60 & 70 Ranges	169,569	228,746	181,701	
4808, 4809 & PM	0	15,502	40,032	
Subtotal	169,569	244,248	221,733	
Adjustments				
MOAs, 60 & 70 Ranges	0	0	0	
Aug, Sept & Oct [4]	56,523	0	0	
R4808, 4809 & PM [5]	47,090	38,645	0	
Military Aircraft				
MOAs, 60 & 70 Ranges	226,092	228,746	181,701	212,180
R4808, 4809 & PM	47,090	54,147	40,032	47,090
Military Aircraft	273,182	282,893	221,733	259,269
Civilian / Commercial [6]	19,161	19,161	19,161	19,161
Grand Total CY	292,343	302,054	240,894	278,430

Notes: 1. Partial CY 95 data. Data not available for August, September and October 1995 and no data available for R 4808E and 4808W, R4809 and Pahute Mesa.
2. Partial CY 96 data. Data for R 4808E and 4808W, R4809 and Pahute Mesa collected in October, November & December 1996 only.
3. Full CY 97 data.
4. Prorated from 1995 annual total for nine months.
5. CY 95 value for R4808, R4809 and Pahute Mesa is average of 96 and 97 data. CY 96 value is increased by 75% of the average 96 and 97 data.
6. B-737, Cessna and Small Props — Average from 2001 Utilization Study (CY 91-95).

Table 5. Red Flag Sortie Distribution by Airspace Subdivision			
Red Flag Factor	*1*	*5*	*10*
Desert MOA			
Caliente	100.0%	40.0%	15.0%
Coyote		20.0%	10.0%
Elgin		20.0%	5.0%
Reveille MOA		20.0%	10.0%
R 4806			
R61			
R62			
R63			
R64			
R65			
Alamo			
R4807			
EC South			1.0%
Pahute Mesa			
R 71			5.0%
R 74			17.0%
R 75			13.0%
R 76			13.0%
R 4808			
R 4808W			6.0%
R 4808E			
R 4809			
EC East			3.0%
EC West			2.0%

Table 6 Projected NRC Distribution by Aircraft Type and Subdivision -- 200,000 Sorties Annually

		AV-8	A-10	B-1	B-2	B-52	C-130	C-141	E-3	EA-6B	F-14
Desert MOA											
	Caliente	138	69	542	10	93	836	101	162	471	311
	Coyote	104	83	377	7	69	419	50	1	235	175
	Elgin	120	92	194	3	46	417	50	2	236	151
Reveille MOA		102	71	381	7	67	419	50	1	235	170
R 4806											
	R61	79	989	7	2	23	4				2
	R62	97	1,157	7	2	23	4				2
	R63	19	1,139	7		21	7				2
	R64	78	1,164	7	2	23	5				1
	R65	81	1,187	7	2	23	8				1
	Alamo	97	1,148	5	2	23	5				1
R4807											
	EC South	27	526	67	1	24	1				53
	Pahute Me	22	149	36	1	15	1				42
	R 71	66	517	197	3	46				1	109
	R 74	150	123	603	13	97	1		1		274
	R 75	132	212	472	10	80	1				222
	R 76	126	559	462	9	80	1			1	222
R 4808											
	R 4808W	73	189	229	5	39	2				120
	R 4808E					3					
R 4809			2								
	EC East	42	134	143	4	35	1				80
	EC West	45	149	105	2	28	1		1		66
Total		1,599	9,659	3,848	84	854	2,133	252	167	1,179	2,003

		F-15	F-16	F-18	F-111	F-117	KC-10	KC-135	Mirage	all Props	Tornado	Helos	Other	Airspace Subunit Total	Airspace Total
Desert MOA															49,884
	Caliente	6,803	11,232	948		26	26	883	333	54	5	250	127	23,420	
	Coyote	3,995	6,819	533		16	13	444	225	26	45	225	81	13,943	
	Elgin	3,716	6,214	484		9	13	443	111	26	3	128	62	12,521	
Reveille MOA		4,002	6,668	530		17	13	443	225	31	47	181	82	13,742	13,742
R 4806															28,021
	R61	562	1,314	29		2		2		1		158	2	3,175	
	R62	716	1,488	38		2		3		1		173	868	4,581	
	R63	774	1,716	37		3		1				211	868	4,804	
	R64	641	1,505	40		2		1				188	2,171	5,827	
	R65	654	2,856	36		2		2		8		177	868	5,910	
	Alamo	716	1,504	45		2		2				176		3,725	
R4807															75,999
	EC South	1,250	3,214	125		3		3	25	2	46	85	885	6,334	
	Pahute Me	1,421	2,849	128				1				70	455	5,188	
	R 71	2,111	4,806	286		9		3	114		43	62	1,234	9,607	
	R 74	5,699	9,732	782		28		2	380	347	46	954	1,239	20,470	
	R 75	4,790	8,473	642		21		2	291	347	41	947	1,267	17,951	
	R 76	3,894	7,914	605		22		3	291	347	46	104	1,763	16,450	
R 4808															14,101
	R 4808W	2,724	5,019	340		10		3	133		4	76	875	9,842	
	R 4808E	435	434								41	1,174	2,172	4,259	
R 4809		163	266							347		441	1,301	2,520	18,252
	EC East	2,303	4,198	239		5		2	69	347	46	97	19	7,765	
	EC West	1,961	3,893	198		3		1	47	2	46	100	1,321	7,967	
Total		49,329	92,116	6,065		182	65	2,241	2,244	1,885	460	5,977	17,659	200,000	200,000

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Table 7 Projected NRC Distribution by Aircraft Type and Subdivision -- 300,000 Sorties Annually

	AV-8	A-10	B-1	B-2	B-52	C-130	C-141	E-3	EA-6B	F-14
Desert MOA										
Caliente	207	103	813	16	140	1,254	151	243	707	466
Coyote	156	125	566	10	104	628	75	1	353	263
Elgin	180	139	291	5	70	626	75	3	354	226
Reveille MOA	154	107	571	10	100	628	75	1	353	255
R 4806										
R61	118	1,483	10	3	34	7				3
R62	146	1,736	10	3	34	7				3
R63	29	1,708	10		31	10				3
R64	117	1,746	10	3	34	8				1
R65	121	1,780	10	3	34	12				1
Alamo	146	1,721	8	3	34	8				1
R4807										
EC South	41	788	100	1	36	1				79
Pahute Me	33	224	53	1	22	1				62
R 71	99	776	296	5	68				1	164
R 74	226	184	905	19	145	1		1		411
R 75	199	318	708	15	119	1				334
R 76	189	839	693	14	121	1			1	334
R 4808										
R 4808W	110	284	343	8	58	3				181
R 4808E					4					
R 4809		3								
EC East	63	201	215	6	53	1				120
EC West	67	224	158	3	41	1		1		98
Total	2,398	14,489	5,772	126	1,282	3,199	377	251	1,768	3,004

	F-15	F-16	F-18	F-111	F-117	KC-10	KC-135	Mirage	all Props	Tornado	Helos	Other	Airspace Subunit Total	Airspace Total
Desert MOA														74,826
Caliente	10,204	16,849	1,421		40	39	1,325	500	81	8	375	190	35,130	
Coyote	5,992	10,228	800		25	20	666	337	39	68	337	121	20,915	
Elgin	5,574	9,320	725		14	20	665	167	39	5	193	92	18,782	
Reveille MOA	6,003	10,002	795		26	20	665	337	47	70	272	122	20,613	20,613
R 4806														42,032
R61	843	1,971	44		3		3		1		237	3	4,762	
R62	1,075	2,233	57		3		4		1		259	1,302	6,871	
R63	1,161	2,571	56		4		1				316	1,302	7,206	
R64	962	1,29[illegible]	60		3		1				282	3,257	8,741	
R65	981	4,285	55		3		3		12		265	1,302	8,866	
Alamo	1,073	2,256	68		3		3				264		5,587	
R4807														113,999
EC South	1,874	4,822	187		4		4	37	3	69	128	1,327	9,501	
Pahute Me	2,131	4,274	191				1				105	682	7,782	
R 71	3,166	7,209	429		14		4	170		65	92	1,851	14,410	
R 74	8,548	14,598	1,173		42		3	570	520	69	1,431	1,858	30,704	
R 75	7,185	12,709	962		32		3	437	520	61	1,421	1,901	26,926	
R 76	5,841	11,871	908		33		4	437	520	69	156	2,644	24,675	
R 4808														21,152
R 4808W	4,087	7,528	511		15		4	200		7	114	1,313	14,763	
R 4808E	653	651								61	1,762	3,258	6,388	
R 4809	245	399							520		661	1,952	3,780	27,378
EC East	3,454	6,297	359		7		3	104	520	69	146	29	11,648	
EC West	2,941	5,840	296		5		1	71	3	69	150	1,982	11,951	
Total	73,994	138,174	9,097		273	98	3,361	3,366	2,827	690	8,966	26,488	300,000	300,000

Table 8. NRC CY91 Sortie Data by Aircraft Type and Subdivision -- 2001 Utilization Study

	A-4	A-6	A-7	AV-8	A-10	B-1	B-2	B-52	C-12	C-130	C-141	C-160	CESSNA	E-3	EA-6	F-4
Alamo		13	26	84	1,004		11	1		1						152
Caliente	4	47	47	76	66	54	50	316	1						4	129
Coyote	3	38	26	50	44	58	62	329		1					2	49
ECE		14		4	18	50	62	329		1					2	626
ECS		8	1	6	345			243		150			5		4	1,342
ECW		12			38	50	53	329	8						4	653
Elgin	4	39	21	30	175			118							2	188
Pahute Mesa		16	24	70	44	9	12	195					12		3	16
R4808E						50	50	110	450	500						
R4808W		16		38	42	5	12	259		300			25		4	537
R4809A									250	500						
R61		4	18	56	836		12	1					12			148
R62		13	26	84	1,020		12	1					12			148
R63		12	29	36	554			1		2						108
R64		1	16	84	1,168		12			500						152
R65			56	84	1,075		12			500			12			148
Reveille	3	34	33	50	28	52	50	214		1			14		4	24
R71		8	10		464	3	1	248	4	11			4		4	1,435
R74		18	28	86	44	61	62	331	250	1					4	58
R75		18	16	48	77	59	62	331	250	1			3		4	727
R76	14	11		6	334	68	50	338	254	500			16		4	1,351
Subtotal:	*28*	*322*	*377*	*892*	*7,376*	*519*	*585*	*3,694*	*1,467*	*2,969*	*0*	*0*	*115*		*45*	*7,991*
RF Sorties:	0	88	141	473	631	77	0	335	0	396	30	25	0	231	46	377
RF Factor:	10	10	10	10	10	10	10	10	5	5	5	5	5	1	5	10
RF Total:	*0*	*880*	*1,410*	*4,730*	*6,310*	*770*	*0*	*3,350*	*0*	*1,980*	*150*	*125*	*0*	*231*	*230*	*3,770*

Nellis Range Complex Utilization - 1991

	F-5	F-14	F-15	F-16	F-18	F-86	F-111	F-117	HELO	KC-10	KC-135	OV-10	RF-4	T-38	U-2	Other	Total
Alamo	4	70	638	1,946	92	4	56	92	159					15		321	*4,685*
Caliente	20	206	3,478	4,184	310		114	3,180	147	3	23		207	129		7	*12,782*
Coyote	4	64	1,187	1,302	130		219	3,254	223		17		210	82		439	*7,789*
ECE		4	609	677	92		207	3,333	150		17		211	36		384	*6,826*
ECS		4	150	532	72		158	3,258	61		17		239	70		1,079	*7,744*
ECW			1,221	1,313	77		199	3,305	164		17		209	74		1,783	*9,509*
Elgin	42	152	3,769	5,528	298	3	54	3,158	154		4		5	144		16	*13,862*
Pahute Mesa		20	367	498	80		154	3,275	18		15		205	68		882	*5,983*
R4808E			500	500			50	1	101							2,676	*4,988*
R4808W		4	178	335	80		99	2,427	11		17		167	64		1,341	*5,961*
R4809A									71							1,500	*2,321*
R61	4	70	562	1,751	85	5	52	67	20				1	17		388	*4,105*
R62	4	71	620	1,865	93	6	60	67	70				1	16		1,319	*5,504*
R63		75	633	1,614	55	2	164	3	128				1	7		1,006	*4,430*
R64		70	561	1,634	71	3	53	64	148				1	16		2,920	*7,474*
R65		70	584	2,868	64	4	73	67	188				11	16		1,281	*7,113*
Reveille		54	1,091	1,156	134		198	4,238	35		8		208	209		268	*8,106*
R71			181	612	104		122	4,227	15		17		253	184		557	*8,464*
R74		32	568	680	112		217	3,393	128		17		211	72		941	*7,314*
R75		20	394	587	100		217	3,523	38		17		211	74		871	*7,648*
R76			210	630	76		207	3,910	87		17		217	135		2,487	*10,922*
Subtotal:	*78*	*986*	*17,501*	*30,212*	*2,125*	*27*	*2,673*	*44,842*	*2,116*	*3*	*203*		*2,568*	*1,428*	*0*	*22,466*	*153,530*
RF Sorties:		0	2,731	4,393	245	0	799	0	0	0	361	163	571	0	22	0	
RF Factor:	10	10	10	10	10	10	10	10	5	5	5	10	10	10	10	5	
RF Total:	*0*	*0*	*27,310*	*43,930*	*2,450*	*0*	*7,990*	*0*	*0*	*0*	*1,805*	*1,630*	*5,710*	*0*	*220*	*0*	*114,981*
																Grand Total:	*268,511*

Table 9. NRC CY92 Sortie Data by Aircraft Type and Subdivision -- 2001 Utilization Study

	A-4	A-6	A-7	AV-8	A-10	B-1	B-2	B-52	C-12	C-130	C-141	CESSNA	DOE	E-3	EA-6	F-4	F-5
Alamo		6	2	6	1,184		34	3		9			3			3	22
Caliente	26	108	131		67	57	50	182		25	2		1		9	18	4
Coyote	24	79	102		105	61	84	188		14			3		3	21	42
ECE	8	22	5		121	53	84	152		9		1	1		5	81	6
ECS					332	6		82		154		3	3			451	
ECW		20			141	52	51	152		7		23	1		3	102	
Elgin	0	64	57	1	134			3		18					6	2	
Pahute Mes	2	28	88	4	113	9	32	46		6		4				8	33
R4808E						50	50	110	450	500			1				
R4808W		32		4	124	5	32	94		304	6	3	1			81	11
R4809A									250	500							
R61		12	2		948		34	3		1			1				6
R62		16	2		1,170		34	3		2		1	1			2	22
R63		14	15		797			3		2			1			2	
R64		18			1,224		34	3		505		1	1			4	
R65		10	40		1,105		34	3		500		3	1			2	
Reveille	26	105	100		28	64	51	188	2	22		1			4	15	47
R71		31			358	9		111		1					7	499	44
R74	12	38	84		113	64	82	188	250	8		1			5	12	39
R75	2	57	64		166	67	85	183	251	6		7	2		5	106	39
R76		53		4	445	79	50	191	250	510		3			5	506	68
Subtotal:	*100*	*713*	*692*	*19*	*8,675*	*576*	*821*	*1,888*	*1,453*	*3,103*	*8*	*51*	*21*		*52*	*1,915*	*383*
RF Sorties:					492	188		230		716	18	251		227	157	281	
RF Factor:	10	10	10	10	10	10	10	10	5	5	5	5	5	1	5	10	10
RF Total:					*4,920*	*1,880*	*0*	*2,300*	*0*	*3,580*	*90*	*1,255*	*0*	*227*	*785*	*2,810*	*0*

Nellis Range Complex Utilization - 1992

	F-14	F-15	F-16	F-18	F-86	F-111	F-117	HELO	KC-10	KC-135	M2000	RF-4	T-34	T-38	ornado	U-2	Other	Total
Alamo	82	637	1,563	179	3	81		329				4	6	12	9		203	*4,380*
Caliente	213	3,440	3,692	926		118	2,415	291	4	9	12	97		43		1	28	*11,969*
Coyote	87	1,589	1,641	435		147	2,399	397		4		93	17	17		1	380	*7,933*
ECE	51	720	927	81		93	2,551	133				92		17		1	289	*5,503*
ECS	7	236	519	8		105	2,096	50				138	1	17		1	1,102	*5,311*
ECW	24	796	1,190	27		88	2,502	106				91		17		1	1,785	*7,179*
Elgin	152	2,794	3,790	875	2	37	2,265	317	2		6			65	2	1	17	*10,610*
Pahute Mes	56	665	710	204		145	2,388	6				82	13	14		1	813	*5,470*
R4808E		500	500					101								1	2,724	*4,987*
R4808W	54	380	485	138		59	2,232	4				64	2	14		1	1,308	*5,438*
R4809A								71									1,500	*2,321*
R61	84	566	1,490	82	3	66		49					8	16	9	1	359	*3,740*
R62	84	620	1,562	175	3	66		124				2	11	16	9	1	1,268	*5,194*
R63	84	616	1,492	60	2	65	5	86					4	10	7	1	1,014	*4,280*
R64	84	580	1,516	32	3	67		187						12	9	1	2,868	*7,149*
R65	84	568	1,927	32	3	63		86						12	9	1	1,536	*6,019*
Reveille	93	1,606	1,599	483		145	2,957	155				150	7	65		1	219	*8,133*
R71	22	241	560	169		76	2,491	50				147	19	63		1	594	*5,493*
R74	79	889	857	291		139	2,581	116		2		91	15	17		1	912	*6,886*
R75	75	709	882	300		129	2,583	130		2		138	6	19		1	839	*6,853*
R76	20	352	773	296		117	2,648	163		1		189	24	53		1	2,149	*8,950*
Subtotal:	*1,435*	*18,504*	*27,675*	*4,793*	*19*	*1,806*	*32,113*	*2,951*	*6*	*18*	*18*	*1,378*	*133*	*499*	*54*	*19*	*21,907*	*133,798*
RF Sorties:	95	2,254	3,615	193		584	57	9		636	201	332			837	25	46	
RF Factor:	10	10	10	10	10	10	10	5	5	5	10	10	5	10	10	5	10	
RF Total:	*950*	*22,540*	*36,150*	*1,930*	*0*	*5,840*	*570*	*45*	*0*	*3,180*	*2,010*	*3,320*	*0*	*0*	*8,370*	*125*	*230*	*103,107*
																	Grand Total:	*236,905*

Table 10. NRC CY93 Sortie Data by Aircraft Type and Subdivision -- 2001 Utilization Study

	A-4	A-6	A-10	AT-38	B-1	B-2	B-52	C-12	C-130	C-141	E-3	EA-6B	EF-111	F-1
Alamo	8	2	1,305	2		62	9	1	23					
Caliente	18	55	44	20	60	50	80		1					9
Coyote	7	41	44	9	56	113	80		1					8
ECE		24	143		55	106	76		1					8
ECS		1	608		3	14	23	12	152					8
ECW		24	169		55	76	74		1					8
Elgin	17		42	16	6	1	13	1	1					
Pahute Mesa	2	24	175		2	62	19		1					10
R4808E					50	61	50	450	500					
R4808W	2	24	199		2	62	12		302					8
R4809A								250	500					
R61	4		1,100	2		64	6	2	19					
R62	9		1,317	2		58	9	2	23					
R63	9		1,448	10			9	2	521					
R64	5		1,341	2		60	7	2	525					
R65	5		1,359	2		35	7		26					
Reveille	23	32	22	9	56	66	73		1					10
R71			538	1	5	13	32	1	1					8
R74	2	36	101	9	55	113	83	250	1					8
R75		24	201		54	105	81	251	1					8
R76			599		58	64	86	251	500					8
Subtotal:	*111*	*287*	*10,755*	*84*	*517*	*1,185*	*829*	*1,475*	*3,101*	*0*	*0*	*0*	*0*	*101*
RF Sorties:		88	616		157		235		462	166	189	149	193	92
RF Factor:		10	10	10	10	10	10	5	5	5	1	5	5	10
RF Total:		*880*	*6,160*	*0*	*1,570*	*0*	*2,350*	*0*	*4,620*	*830*	*189*	*745*	*965*	*920*

Nellis Range Complex Utilization - 1993

	F-4	F-14	F-15	F-16	F-18	F-111	F-117	KC-10	KC-135	RF-4	ornado	Helos	Other	U-2	Total
Alamo	165	23	1,111	2,070	24	54	1			4		92	459		*5,415*
Caliente	389	313	5,055	6,810	819	121	6	2	8	156	8	26	68	1	*14,110*
Coyote	240	138	2,349	3,184	665	135	1			163	8	160	643	2	*8,039*
ECE	364	135	1,115	2,199	516	140				156	8	146	525	3	*5,712*
ECS	470	59	747	1,415	122	86			5	149	10	533	1,274	3	*5,686*
ECW	399	123	1,615	2,301	513	141				155	8	167	2,026	2	*7,849*
Elgin	382	209	3,972	6,196	313	40	7			9	2	55	65	3	*11,350*
Pahute Mesa	329	124	1,000	1,716	526	87				152	8	24	1,033	3	*5,287*
R4808E			500	501		50						100	2,864		*5,126*
R4808W	300	115	998	1,674	496	61				145	8	29	1,535	1	*5,965*
R4809A												71	1,500		*2,321*
R61	120	30	932	1,956	16	26	1			3		19	611		*4,911*
R62	161	30	1,095	2,032	26	52	1			2		96	1,468		*6,383*
R63	149	18	1,023	2,039	13	51	7			2		118	1,072		*6,491*
R64	148	30	1,025	1,987	24	36	1			2		216	3,120		*8,531*
R65	165	30	1,095	3,714	24	47	1			2		193	1,153		*7,858*
Reveille	203	150	2,309	3,142	669	165	1		1	152	8	128	365	2	*7,577*
R71	556	58	802	1,420	212	93	1		5	156	8	39	742	4	*4,687*
R74	265	129	1,315	2,084	592	132	1			155	8	137	1,177	4	*6,649*
R75	396	129	1,157	1,942	560	149				155	8	45	978	4	*6,240*
R76	569	68	870	1,560	420	147			5	158	10	56	2,326	4	*7,751*
Subtotal:	*5,770*	*1,911*	*30,085*	*49,942*	*6,550*	*1,813*	*29*	*2*	*24*	*1,876*	*102*	*2,450*	*25,004*	*36*	*143,938*
RF Sorties:	123	181	1,879	3,210	498	851	70		597	44	464	160	64	26	
RF Factor:	10	10	10	10	10	10	10	5	5	10	10	5	5	5	
RF Total:	*1,230*	*1,810*	*18,790*	*32,100*	*4,980*	*8,510*	*700*	*0*	*2,985*	*440*	*4,640*	*800*	*320*	*130*	*95,744*
													Grand Total:		*239,682*

Table 11. NRC CY94 Sortie Data by Aircraft Type and Subdivision -- 2001 Utilization Study

	A-4	A-6	AV-8	A-10	B-1	B-2	B-52	C-5	C-12	C-130	C-141	E-2	E-3	EA-6B	EF-111
Alamo				1,838		16	16			5				4	
Caliente	4		84	126	72	50	88		8	11				8	16
Coyote			76	51	72	65	82		6	6				3	15
ECE			76	169	66	66	82		3	2				2	15
ECS				569	9	4	19		1	1					
ECW			34	210	66	55	81		3						
Elgin	4		2	166	15		31		7	8				6	18
Pahute Mesa			76	238	7	16	19		1	2					17
R4808E					50	54	50		451						
R4808W			76	268	7	16	12			2					15
R4809A									250						
R61				1,170		16	16		1	4				4	
R62				1,340		17	17		1	6				4	
R63				1,226			22		1	5				4	
R64	1			1,378		16	15	1		4				4	
R65				1,374		13	15	1	1	19	3			4	
Reveille			78	49	74	52	80			11				7	
R71				568	10	3	20		2	4					
R74			76	135	54	66	81		253	2				3	15
R75			58	229	69	66	94		250	2				1	15
R76				582	61	53	90		250	3				1	
Subtotal:	*9*	*0*	*636*	*11,686*	*632*	*644*	*930*	*2*	*1,489*	*97*	*3*	*0*	*0*	*55*	*126*
RFSorties	0	161	218	433	212	0	143	9	0	463	33	25	184	241	110
RF Factor		10	10	10	10	10	10	5	5	5	5	1	1	5	5
RF Total:		*1,610*	*2,180*	*4,330*	*2,120*	*0*	*1,430*	*45*	*0*	*2,315*	*165*	*25*	*184*	*1,205*	*550*

Nellis Range Complex Utilization - 1994

	F-1	F-4	F-14	F-15	F-16	F-18	F-111	F-117	KC-10	KC-135	RF-4	T-38	ornado	Helos	Other	U-2	Total
Alamo		127	13	680	1,668	63	60	30				1		211	2	8	*4,742*
Caliente		372	255	5,167	6,405	1,084	163	2	3	8	51	14	12	98	10	9	*14,120*
Coyote		302	106	2,661	3,157	785	149	1	2	4	49	2	16	207	9	11	*7,837*
ECE		529	63	1,890	2,391	549	139	4		4	48		16	174	4	16	*6,308*
ECS		775	8	706	1,363	172	69			3	48		16	3	1,000	5	*4,771*
ECW		581	10	1,811	2,106	528	123	4		2	49		16	184	1,502	14	*7,379*
Elgin		355	196	3,594	4,850	566	66	2	3		3	14		100	12	5	*10,023*
Pahute Mesa		502	28	1,331	1,621	536	69			2	49		10	37	502		*5,063*
R4808E				500	500		50							173	2,500		*4,328*
R4808W		471	26	1,253	1,560	468	69			2	49		2	116	1,000	8	*5,420*
R4809A														71	1,500		*1,821*
R61		90	9	553	1,611	48	52	1						128	1		*3,704*
R62		117	13	635	1,666	56	52	29				1		241	1,000		*5,195*
R63		182	10	768	1,886	59	95	30				1		198	1,000		*5,487*
R64		107	11	619	1,580	47	52	1						348	2,503		*6,687*
R65		150	9	680	2,791	53	77	1						256	1,001		*6,448*
Reveille		153	107	2,669	3,217	806	148	1	2	6	53		16	26	9	19	*7,583*
R71		807	28	745	1,377	202	90	4		4	52		16	49	502	16	*4,499*
R74		368	89	1,723	2,285	616	136	4		6	49		16	73	507	15	*6,572*
R75		590	37	1,477	1,806	554	127	4		6	49		16	76	503	15	*6,044*
R76		798	20	795	1,429	203	137	4		7	49		16	103	2,000	16	*6,617*
Subtotal:	*0*	*7,376*	*1,038*	*30,257*	*45,269*	*7,395*	*1,923*	*122*	*10*	*54*	*598*	*33*	*168*	*2,872*	*17,067*	*157*	*130,648*
RF Sorties	314	263	79	1,990	2,870	269	479	46	0	585	0	0	911	73	64	0	
RF Factor	10	10	10	10	10	10	10	10	5	5	10	10	10	5	5	5	
RF Total:	*3,140*	*2,630*	*790*	*19,900*	*28,700*	*2,690*	*4,790*	*460*	*0*	*2,925*	*0*	*0*	*9,110*	*365*	*320*	*0*	*91,979*
																Grand Total:	*222,627*

Table 12. NRC CY95 Sortie Data by Aircraft Type and Subdivision -- 2001 Utilization Study

	AV-8	A-10	B-1	B-2	B-52	C-130	C-141	E-3	EA-6B	EF-111	F-4	F-14
Alamo	112	1,323	6	2	26	6					161	1
Caliente	21	66	53		34	2		2	1	7	714	136
Coyote	28	87	54		31	2		1		10	975	54
ECE	21	152	51	2	26	1				10	1,220	48
ECS	22	605	39		23	1				7	1,627	46
ECW	33	170	45	1	22	1		1		10	1,374	46
Elgin	92	102	33		29			2	1	1	624	100
Pahute Mesa	25	172	41	1	17	1				12	1,092	48
R4808E					3							
R4808W	29	213	35	1	15	2				9	1,107	50
R4809A		2									62	
R61	91	1,140	8	2	26	5					146	2
R62	112	1,334	8	2	26	5					157	2
R63	22	1,313	8		24	8					152	2
R64	90	1,342	8	2	26	6					159	1
R65	93	1,368	8	2	26	9					147	1
Reveille	26	73	58		28	2		1		10	856	48
R71	30	592	37		28				1	9	1,641	52
R74	17	126	48	1	28	1		1		10	1,023	64
R75	33	233	49	1	28	1				11	1,306	64
R76	26	633	37		29	1			1	9	1,672	64
Subtotal:	*923*	*11,046*	*626*	*17*	*495*	*54*	*0*	*8*	*4*	*115*	*16,215*	*829*
	92	9	381	8	49	481	58	185	271	31	335	148
RF Factor	10	10	10	10	10	5	5	1	5	5	10	10
RF Total:	*920*	*90*	*3,810*	*80*	*490*	*2,405*	*290*	*185*	*1,355*	*155*	*3,350*	*1,480*

Nellis Range Complex Utilization - 1995

	F-15	F-16	F-18	F-111	F-117	KC-10	KC-135	Mirage	m. Prop	ornado	Helos	Other	Total
Alamo	777	1,573	52	48	2		2				203	0	*4,294*
Caliente	4,016	5,700	419	105	2				4	6	68	16	*11,372*
Coyote	2,029	2,529	166	90			3	3	1	52	149	28	*6,292*
ECE	1,815	2,313	141	87			2	3	400	53	112	22	*6,479*
ECS	1,130	1,643	99	56	1		3	3	2	53	98	1,020	*6,478*
ECW	1,663	2,243	138	92			1	3	2	53	115	1,523	*7,536*
Elgin	3,002	4,361	333	43	1		2		1	4	38	6	*8,775*
Pahute Mesa	1,575	2,193	147	51			1				81	524	*5,981*
R4808E	502	500								47	1,354	2,504	*4,910*
R4808W	1,592	2,065	123	54			3			5	88	1,009	*6,400*
R4809A	185	245		3					400		508	1,500	*2,905*
R61	616	1,369	34	32	2		2		1		182	2	*3,660*
R62	786	1,559	44	40	2		3		1		199	1,001	*5,281*
R63	818	1,826	43	74	3		1				243	1,001	*5,538*
R64	708	1,576	46	31	2		1				217	2,503	*6,718*
R65	723	3,146	42	31	2		2		9		204	1,001	*6,814*
Reveille	2,048	2,474	162	79	1		2	3	7	54	99	29	*6,060*
R71	1,116	1,721	105	70	1		3	3		50	71	1,423	*6,953*
R74	2,259	2,790	138	91			2	3	400	53	1,100	1,428	*9,583*
R75	2,210	2,798	156	82			2	3	400	47	1,092	1,461	*9,977*
R76	1,191	1,788	114	70	1		3	3	400	53	120	2,032	*8,247*
Subtotal:	*30,761*	*46,412*	*2,502*	*1,229*	*20*	*0*	*38*	*27*	*2,028*	*530*	*6,341*	*20,033*	*140,253*
	1,912	4,022	449	549	19	15	509	256	29		110	65	
RF Factor	10	10	10	10	10	5	5	10	5	10	5	5	
RF Total:	*19,120*	*40,220*	*4,490*	*5,490*	*190*	*75*	*2,545*	*2,560*	*145*	*0*	*550*	*325*	*90,320*
												Grand Total:	*230,573*

Table 13. NRC Partial CY95 Sortie Data by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	77	876	2,698	138		286	4,075
Caliente	251	1,508	5,945	4,786	2,935	553	15,978
Coyote	471	1,503	3,407	4,786	2,935	540	13,642
Elgin	321	1,361	4,963	3,337	2,874	624	13,480
Reveille	372	1,328	3,499	4,785	2,932	528	13,444
R61	65	696	2,581	138		221	3,701
R62	75	885	1,887			261	3,108
R63	70	1,055	1,842	1		259	3,227
R64	73	835	1,890			281	3,079
R65	67	746	2,999	2		278	4,092
R71	1,011	1,117	2,633	4,683	2,932	467	12,843
R74	510	1,321	3,236	4,683	2,932	449	13,131
R75	712	1,372	3,184	4,683	2,928	488	13,367
R76	1,001	1,289	2,643	4,683	2,932	512	13,060
EC East	669	1,350	3,235	4,683	2,932	443	13,312
EC West	783	1,312	3,087	4,684	2,932	444	13,242
EC South	1,035	1,170	2,689	4,683	2,932	279	12,788
Total	7,563	19,724	52,418	50,755	32,196	6,913	169,569

1) Data not available for August, September and October

Table 14. NRC Sortie Data January 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	8	76	131	138		22	375
Caliente	13	108	295	1,150		26	1,592
Coyote	55	134	10	1,150		33	1,382
Elgin	27	136	463	395		19	1,040
Reveille	28	144	14	1,149		30	1,365
R61	8	66	122	138		9	343
R62	6	77	134			21	238
R63	2	106	123			19	250
R64	5	78	137			6	226
R65	6	34	379			9	428
R71	220	128	44	1,142		9	1,543
R74	70	139	4	1,142		10	1,365
R75	134	163	8	1,142		21	1,468
R76	202	123	52	1,142		18	1,537
EC East	136	131	8	1,142		16	1,433
EC West	170	117	8	1,142		13	1,450
EC South	220	128	44	1,142		6	1,540
Total	1,310	1,888	1,976	12,114		287	17,575

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Table 15. NRC Sortie Data February 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	2	126	156			19	303
Caliente	42	89	707	1,193		38	2,069
Coyote	112	186	41	1,193		37	1,569
Elgin	52	92	853	788		7	1,792
Reveille	106	181	28	1,193		35	1,543
R61	1	114	132			17	264
R62	2	127	158			19	306
R63	2	152	166			29	349
R64	2	122	168			20	312
R65	1	102	368	1		19	491
R71	138	149	24	1,193		37	1,541
R74	104	132	50	1,193		32	1,511
R75	156	106	12	1,193		67	1,534
R76	138	159	28	1,193		37	1,555
EC East	136	150	28	1,193		31	1,538
EC West	154	131	12	1,193		31	1,521
EC South	138	161	24	1,193		40	1,556
Total	1,286	2,279	2,955	12,719		515	19,754

Table 16. NRC Sortie Data March 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	20	106	241			25	392
Caliente	30	114	793		1,917	48	2,902
Coyote	65	172	203		1,917	35	2,392
Elgin	55	111	754		1,856	52	2,828
Reveille	52	138	225		1,914	11	2,340
R61	19	92	239			12	362
R62	20	102	250			22	394
R63	19	158	200			33	410
R64	19	95	287			16	417
R65	19	91	507			9	626
R71	126	187	175		1,914	6	2,408
R74	70	142	212		1,914	14	2,352
R75	108	184	218		1,914	14	2,438
R76	116	237	180		1,914	20	2,467
EC East	94	162	218		1,914		2,388
EC West	114	126	230		1,914		2,384
EC South	118	210	210		1,914	8	2,460
Total	1,064	2,427	5,142		21,002	325	29,960

Table 17. NRC Sortie Data April 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	20	74	333			9	436
Caliente	33	238	410		1,018	201	1,900
Coyote	46	155	226		1,018	195	1,640
Elgin	45	231	428		1,018	197	1,919
Reveille	38	134	240		1,018	183	1,613
R61	14	43	336			8	401
R62	20	63	334			9	426
R63	20	83	340			31	474
R64	20	61	340			31	452
R65	22	70	401			33	526
R71	103	158	174		1,018	159	1,612
R74	52	146	219		1,018	170	1,605
R75	84	152	251		1,014	164	1,665
R76	107	153	167		1,018	173	1,618
EC East	74	152	231		1,018	177	1,652
EC West	96	136	202		1,018	170	1,622
EC South	107	157	163		1,018	165	1,610
Total	901	2,206	4,795		11,194	2,075	21,171

Table 18. NRC Sortie Data May 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	10	101	247			71	429
Caliente	47	312	909			8	1,276
Coyote	39	262	822			2	1,125
Elgin	55	186	255			42	538
Reveille	20	238	831			7	1,096
R61	10	87	213			69	379
R62	10	91	248			70	419
R63	10	111	250			73	444
R64	10	84	242			70	406
R65	10	89	266			71	436
R71	90	115	365			1	571
R74	46	216	778			2	1,042
R75	56	219	744				1,019
R76	95	132	367			1	595
EC East	58	209	752			2	1,021
EC West	68	266	697			3	1,034
EC South	102	118	352			2	574
Total	736	2,836	8,338			494	12,404

Table 19. NRC Sortie Data June 95 by Organization and Subdivision -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		108	579			103	790
Caliente	34	249	767	479		150	1,679
Coyote	47	217	549	479		147	1,439
Elgin	29	126	686	393		230	1,464
Reveille	43	203	568	479		153	1,446
R61		71	552			87	710
R62		118	211			92	421
R63		112	235			13	360
R64		107	180			94	381
R65		117	238			93	448
R71	73	113	504	479		156	1,325
R74	55	211	533	479		142	1,420
R75	54	205	499	479		138	1,375
R76	70	126	492	479		161	1,328
EC East	51	203	535	479		142	1,410
EC West	51	195	559	479		142	1,426
EC South	70	118	490	479		12	1,169
Total	577	2,599	8,177	5,183		2,055	18,591

Table 20. NRC Sortie Data July 95 by Organization and Subdivision -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	9	36	176			28	249
Caliente	11	83	410	1,964		64	2,532
Coyote	48	269	10	1,964		39	2,330
Elgin	15	93	531	1,761		42	2,442
Reveille	26	207	10	1,964		59	2,266
R61	9	30	136			17	192
R62	9	28	164			17	218
R63	9	32	163	1		42	247
R64	9	30	168			16	223
R65	9	32	171	1		41	254
R71	67	164		1,869		46	2,146
R74	50	239		1,869		38	2,196
R75	54	239		1,869		42	2,204
R76	71	233		1,869		48	2,221
EC East	54	239		1,869		36	2,198
EC West	54	239		1,870		46	2,209
EC South	71	169		1,869		32	2,141
Total	575	2,362	1,939	20,739		653	26,268

Table 21. NRC Sortie Data November 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	4	171	324			8	507
Caliente	32	191	973			17	1,213
Coyote	8	53	907			50	1,018
Elgin	34	267	318			34	653
Reveille	8	39	944			49	1,040
R61		127	338			1	466
R62	4	160	342			10	516
R63	4	179	316			18	517
R64	4	167	328			1	500
R65		142	403			2	547
R71	106	72	767			36	981
R74	8	54	847			36	945
R75	14	62	857			39	972
R76	114	72	769			40	995
EC East	14	60	870			36	980
EC West	30	58	850			36	974
EC South	116	60	757			14	947
Total	500	1,934	10,910			427	13,771

Table 22. NRC Sortie Data December 95 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	4	78	511			1	594
Caliente	9	124	681			1	815
Coyote	51	55	639			2	747
Elgin	9	119	675			1	804
Reveille	51	44	639			1	735
R61	4	66	513			1	584
R62	4	119	46			1	170
R63	4	122	49			1	176
R64	4	91	40			27	162
R65		69	266			1	336
R71	88	31	580			17	716
R74	55	42	593			5	695
R75	52	42	595			3	692
R76	88	54	588			14	744
EC East	52	44	593			3	692
EC West	46	44	529			3	622
EC South	93	49	649				791
Total	614	1,193	8,186			82	10,075

Table 23. NRC CY96 Sortie Data by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	4	1,094	3,180	494	1	605	5,378
Caliente	59	2,222	7,169	8,168	2,406	1,817	21,841
Coyote	114	1,422	4,142	8,226	2,494	1,492	17,890
Elgin	63	2,116	6,586	7,284	2,494	1,523	20,066
Reveille	118	1,334	4,203	7,710	2,488	1,412	17,265
R61	8	917	3,045			567	4,537
R62	8	1,034	3,169			598	4,809
R63	8	1,327	2,906			689	4,930
R64	8	904	3,153	2		573	4,640
R65	8	972	4,308	3		645	5,936
R71	202	958	3,850	8,254	2,494	1,197	16,955
R74	126	1,228	4,055	8,254	2,494	1,335	17,492
R75	140	1,207	4,147	8,254	2,494	1,349	17,591
R76	204	1,024	4,085	8,254	2,494	1,265	17,326
EC East	146	1,233	4,109	8,254	2,494	1,341	17,577
EC West	140	1,212	3,991	8,254	2,494	1,355	17,446
EC South	206	968	4,159	8,254	2,494	986	17,067
R4808E[(2)]		10	469				479
R4808W[(2)]		185	1,670	2,661		629	5,145
Pah. Mesa[(2)]		184	1,676	2,661		636	5,157
R4809A[(2)]		150	1,502	2,539		530	4,721
Total	1,562	21,701	75,574	97,526	27,341	20,544	244,248

Data collected in October, November & December only
For R4808E, R4808W, Pahute Mesa, R4809A

Table 24. NRC Sortie Data January 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		148	153			12	313
Caliente	19	160	446	1,932		38	2,595
Coyote	46	56	24	1,903		18	2,047
Elgin	19	184	556	1,658		19	2,436
Reveille	62	34	16	1,933		19	2,064
R61	4	141	132			14	291
R62	4	164	146			15	329
R63	4	164	78			20	266
R64	4	138	144			22	308
R65	4	111	377			18	510
R71	98	49	26	1,933		7	2,113
R74	62	44	24	1,933		11	2,074
R75	70	30	24	1,933		28	2,085
R76	98	49	28	1,933		28	2,136
EC East	70	40	24	1,933		9	2,076
EC West	70	32	24	1,933		15	2,074
EC South	98	49	28	1,933		9	2,117
Total	732	1,593	2,250	20,957		302	25,834

Table 25. NRC Sortie Data February 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo	4	93	132			20	249
Caliente	22	217	633	886		15	1,773
Coyote	24	65	243	886		17	1,235
Elgin	20	226	680	183		18	1,127
Reveille	20	55	242	886		9	1,212
R61	4	87	117			17	225
R62	4	93	125			17	239
R63	4	140	111			21	276
R64	4	88	147			21	260
R65	4	78	382	1		23	488
R71	76	57	42	886		18	1,079
R74	28	60	231	886		8	1,213
R75	50	32	237	886		6	1,211
R76	76	55	131	886		38	1,186
EC East	40	60	237	886		10	1,233
EC West	50	24	140	886		8	1,108
EC South	78	53	126	886		6	1,149
Total	508	1,483	3,956	9,044		272	15,263

Table 26. NRC Sortie Data March 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		118	203			39	360
Caliente	18	207	524		1,621	117	2,487
Coyote	44	51	173		1,621	107	1,996
Elgin	24	266	607		1,621	102	2,620
Reveille	36	57	167		1,615	80	1,955
R61		116	176			25	317
R62		134	200			28	362
R63		144	236			29	409
R64		116	198			27	341
R65		124	275			29	428
R71	28	96	87		1,621	93	1,925
R74	36	47	172		1,621	100	1,976
R75	20	67	158		1,621	73	1,939
R76	30	98	117		1,621	74	1,940
EC East	36	50	169		1,621	96	1,972
EC West	20	69	149		1,621	98	1,957
EC South	30	86	165		1,621	61	1,963
Total	322	1,846	3,776		17,825	1,178	24,947

Table 27. NRC Sortie Data April 96 by Organization and Subdivision -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		88	348		1	61	498
Caliente		289	642		785	99	1,815
Coyote		162	488		873	71	1,594
Elgin		214	628		873	101	1,816
Reveille		162	516		873	72	1,623
R61		81	332			53	466
R62		97	336			55	488
R63		111	328			49	488
R64		88	314			56	458
R65		99	386			59	544
R71		150	611		873	68	1,702
R74		156	486		873	66	1,581
R75		156	551		873	63	1,643
R76		148	604		873	72	1,697
EC East		146	516		873	66	1,601
EC West		146	516		873	60	1,595
EC South		148	597		873	74	1,692
Total		2,441	8,199		9,516	1,145	21,301

Table 28. NRC Sortie Data May 96 by Organization and Subdivision -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		71	294			52	417
Caliente		286	936			205	1,427
Coyote		196	780			191	1,167
Elgin		239	493			97	829
Reveille		184	742			192	1,118
R61		55	281			51	387
R62		72	282			47	401
R63		81	258			71	410
R64		61	292			32	385
R65		70	324			49	443
R71		117	716			191	1,024
R74		117	716			189	1,022
R75		115	736			191	1,042
R76		115	735			195	1,045
EC East		113	731			177	1,021
EC West		115	729			195	1,039
EC South		114	747			196	1,057
Total		2,121	9,792			2,321	14,234

Table 29. NRC Sortie Data June 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		47	588			5	640
Caliente		165	765			6	936
Coyote		112	571			8	691
Elgin		154	773			7	934
Reveille		112	600			5	717
R61		16	570			4	590
R62		47	588			6	641
R63		54	585			38	677
R64		37	587			5	629
R65		32	604			6	642
R71		18	568			4	590
R74		18	568			4	590
R75		18	568			3	589
R76		19	568			4	591
EC East		34	568			4	606
EC West		32	568			5	605
EC South		18	568				586
Total		933	10,207			114	11,254

Table 30. NRC Sortie Data July 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		142	237			3	382
Caliente		228	434	2,230		45	2,937
Coyote		325	1	2,230		46	2,602
Elgin		160	501	2,232		28	2,921
Reveille		297		2,230		44	2,571
R61		122	264			3	389
R62		108	281			3	392
R63		167	236			28	431
R64		103	257			3	363
R65		116	308			6	430
R71		101	13	2,230		29	2,373
R74		324	1	2,230		30	2,585
R75		324	1	2,230		44	2,599
R76		105	23	2,230		36	2,394
EC East		336	1	2,230		46	2,613
EC West		326	1	2,230		47	2,604
EC South		123	25	2,230			2,378
Total		3,407	2,584	24,532		441	30,964

Table 31. NRC Sortie Data August 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		110	186	494		39	829
Caliente		85	623	453		417	1,578
Coyote		213	54	544		268	1,079
Elgin		55	661	544		401	1,661
Reveille		199	102			258	559
R61		109	179			38	326
R62		111	175			46	332
R63		170	158			56	384
R64		85	190			36	311
R65		100	279			62	441
R71		131	37	544		164	876
R74		219	47	544		242	1,052
R75		221	47	544		250	1,062
R76		164	33	544		186	927
EC East		220	47	544		258	1,069
EC West		222	47	544		247	1,060
EC South		130	33	544		42	749
Total		2,544	2,898	5,843		3,010	14,295

Table 32. NRC Sortie Data September 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		53	74			68	195
Caliente		133	298			28	459
Coyote		74	138			38	250
Elgin		120	266			31	417
Reveille		70	140			22	232
R61		26	75			63	164
R62		35	75			69	179
R63		81	74			83	238
R64		37	75			64	176
R65		29	138			95	262
R71		65	142			19	226
R74		66	138			22	226
R75		61	138			27	226
R76		65	150			25	240
EC East		66	146			27	239
EC West		66	136			22	224
EC South		67	150			12	229
Total		1,114	2,353			715	4,182

Table 33. NRC Sortie Data October 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		119	238			104	461
Caliente		154	578	1,673		424	2,829
Coyote		24	457	1,669		339	2,489
Elgin		185	433	1,673		351	2,642
Reveille		22	466	1,669		326	2,483
R61		79	231			100	410
R62		97	248			105	450
R63		113	228			117	458
R64		92	235			97	424
R65		121	287			85	493
R71		28	429	1,669		287	2,413
R74		22	463	1,669		320	2,474
R75		30	462	1,669		320	2,481
R76		62	422	1,669		285	2,438
EC East		30	453	1,669		316	2,468
EC West		30	467	1,669		317	2,483
EC South		30	457	1,669		267	2,423
R4808E		8					8
R4808W		30	473	1,669		301	2,473
Pah. Mesa		29	467	1,669		300	2,465
R4809A		26	420	1,669		237	2,352
Total		1,331	7,914	23,374		4,998	37,617

Table 34. NRC Sortie Data November 96 by Organization and Subdivision-- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		77	234			200	511
Caliente		155	678	994		400	2,227
Coyote		41	606	994		382	2,023
Elgin		165	389	994		341	1,889
Reveille		41	610	992		378	2,021
R61		72	190			195	457
R62		51	220			201	472
R63		79	201			171	451
R64		47	201	2		195	445
R65		70	293	2		186	551
R71		41	638	992		310	1,981
R74		41	612	992		336	1,981
R75		41	623	992		337	1,993
R76		37	648	992		315	1,992
EC East		33	612	992		325	1,962
EC West		41	614	992		334	1,981
EC South		39	656	992		312	1,999
R4808E		2					2
R4808W		41	608	992		321	1,962
Pah. Mesa		41	608	992		329	1,970
R4809A		43	568	870		286	1,767
Total		1,198	9,809	13,776		5,854	30,637

Table 35. NRC Sortie Data December 96 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		28	493			2	523
Caliente		143	612			23	778
Coyote		103	607			7	717
Elgin		148	599			27	774
Reveille		101	602			7	710
R61		13	498			4	515
R62		25	493			6	524
R63		23	413			6	442
R64		12	513			15	540
R65		22	655			27	704
R71		105	541			7	653
R74		114	597			7	718
R75		112	602			7	721
R76		107	626			7	740
EC East		105	605			7	717
EC West		109	600			7	716
EC South		111	607			7	725
R4808E			469				469
R4808W		114	589			7	710
Pah. Mesa		114	601			7	722
R4809A		81	514			7	602
Total		1,690	11,836			194	13,720

Table 36. NRC CY97 Summary and Monthly Sortie Data by Organization -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		570	2,801	59		845	4,275
Caliente		2,230	6,796	2,658	2,775	3,762	18,221
Coyote		2,089	3,646	2,658	2,775	2,714	13,882
Elgin		1,965	6,758	106	2,775	2,930	14,534
Reveille		2,116	3,542	2,658	2,779	2,639	13,734
R61		537	2,697	250		782	4,266
R62		564	2,862	121		810	4,357
R63		779	2,301			1,080	4,160
R64		515	2,743			965	4,223
R65		470	3,706			1,003	5,179
R71		2,161	3,475	2,658	2,763	2,403	13,460
R74		2,076	3,530	2,658	2,763	2,583	13,610
R75		1,990	3,570	2,658	2,763	2,509	13,490
R76		2,100	3,562	2,541	2,763	2,678	13,644
EC East		2,076	3,488	2,658	2,763	2,605	13,590
EC West		2,055	3,491	2,658	2,763	2,553	13,520
EC South		2,091	3,540	2,658	2,763	2,504	13,556
R4808E[(2)]		452	2,237	2,091		1,024	5,804
R4808W[(2)]		1,601	1,588	963	2,775	1,281	8,208
Pah. Mesa[(2)]		1,963	3,476	2,655	2,650	2,413	13,157
R4809A[(2)]		2,073	3,205	2,658	2,763	2,164	12,863
Total		32,473	73,014	35,366	38,633	42,247	221,733

Table 37. NRC Sortie Data January 97 by Organization and Subdivision -- Range Group Scheduling

Subdivision	Scheduling Organization 561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		64	181			64	309
Caliente		192	524			94	810
Coyote		199	75			200	474
Elgin		109	569			10	688
Reveille		218	57			225	500
R61		61	148			38	247
R62		64	174			70	308
R63		102	109			51	262
R64		59	154			78	291
R65		51	352			65	468
R71		205	49			118	372
R74		198	45			235	478
R75		202	45			246	493
R76		200	61			282	543
EC East		204	45			237	486
EC West		205	45			208	458
EC South		206	45			184	435
R4808E		3					3
R4808W		182	49			116	347
Pahute Mesa		185	57			184	426
R4809A		197	25			109	331
Total		3106	2809			2814	8729

Table 38. NRC Sortie Data February 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		23	123			50	196
Caliente		343	417		1317	479	2,556
Coyote		437	58		1317	226	2,038
Elgin		237	525		1317	389	2,468
Reveille		410	66		1317	254	2,047
R61		23	115			44	182
R62		23	121			48	192
R63		58	74			206	338
R64		42	112			105	259
R65		31	313			69	413
R71		403	42		1305	229	1,979
R74		409	26		1305	223	1,963
R75		401	40		1305	241	1,987
R76		403	42		1305	242	1,992
EC East		404	40		1305	242	1,991
EC West		402	36		1305	235	1,978
EC South		395	44		1305	243	1,987
R4808E		3					3
R4808W		403	34		1317	236	1,990
Pahute Mesa		357	34		1305	230	1,926
R4809A		398	20		1305	192	1,915
Total		5605	2282		18330	4183	30400

Table 39. NRC Sortie Data March 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		42	212			79	333
Caliente		476	358		1458	405	2,697
Coyote		391	156		1458	136	2,141
Elgin		400	503		1458	445	2,806
Reveille		435	113		1462	114	2,124
R61		37	198			80	315
R62		39	198			81	318
R63		57	129			87	273
R64		47	193			83	323
R65		27	419			91	537
R71		418	139		1458	100	2,115
R74		430	105		1458	99	2,092
R75		370	193		1458	107	2,128
R76		424	168		1458	109	2,159
EC East		428	131		1458	100	2,117
EC West		420	142		1458	100	2,120
EC South		424	170		1458	90	2,142
R4808E		7					7
R4808W		418	123		1458	78	2,077
Pahute Mesa		416	125		1345	83	1,969
R4809A		419	99		1458	70	2,046
Total		6125	3874		20303	2537	32839

Table 40. NRC Sortie Data April 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		13	99			76	188
Caliente		289	436			378	1,103
Coyote		333	309			270	912
Elgin		266	376			245	887
Reveille		328	314			237	879
R61		13	90			69	172
R62		13	100			77	190
R63		52	89			127	268
R64		9	102			119	230
R65		12	136			151	299
R71		337	365			243	945
R74		325	337			265	927
R75		301	383			268	952
R76		326	372			273	971
EC East		334	344			255	933
EC West		324	343			251	918
EC South		328	372			265	965
R4808E						3	3
R4808W		329	329			251	909
Pahute Mesa		299	346			258	903
R4809A		332	303			202	837
Total		4563	5545			4283	14391

Table 41. NRC Sortie Data May 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		77	157			170	404
Caliente		138	664			784	1,586
Coyote		102	591			663	1,356
Elgin		161	447			619	1,227
Reveille		96	589			658	1,343
R61		78	165			168	411
R62		81	153			139	373
R63		107	78			88	273
R64		67	151			153	371
R65		57	126			91	274
R71		76	435			570	1,081
R74		87	573			665	1,325
R75		72	437			515	1,024
R76		72	439			596	1,107
EC East		75	435			612	1,122
EC West		72	435			606	1,113
EC South		72	431			587	1,090
R4808E						5	5
R4808W		70	433			567	1,070
Pahute Mesa		72	445			537	1,054
R4809A		72	390			558	1,020
Total		1704	7574			9351	18629

Table 42. NRC Sortie Data June 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		37	465			52	554
Caliente		156	823			72	1,051
Coyote		75	588			66	729
Elgin		150	834			68	1,052
Reveille		75	574			47	696
R61		35	463			49	547
R62		38	547			49	634
R63		62	527			94	683
R64		32	524			52	608
R65		37	533			78	648
R71		105	584			62	751
R74		75	584			48	707
R75		75	582			56	713
R76		74	586			67	727
EC East		75	583			65	723
EC West		75	583			64	722
EC South		76	586			64	726
R4808E			482			1	483
R4808W		75	574			13	662
Pahute Mesa		75	582			54	711
R4809A		106	582			13	701
Total		1508	12186			1134	14828

Table 43. NRC Sortie Data July 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		72	263	59		39	433
Caliente		104	471	963		62	1,600
Coyote		123	54	963		57	1,197
Elgin		139	594	106		58	897
Reveille		115	48	963		32	1,158
R61		68	242	250		37	597
R62		60	254	121		40	475
R63		85	176			59	320
R64		38	233			40	311
R65		32	187			66	285
R71		123	50	963		30	1,166
R74		123	46	963		27	1,159
R75		121	46	963		24	1,154
R76		123	50	846		33	1,052
EC East		123	46	963		31	1,163
EC West		123	46	963		31	1,163
EC South		123	50	963		20	1,156
R4808E		12		396			408
R4808W		124	46	963		20	1,153
Pahute Mesa		123	56	963		22	1,164
R4809A		116	46	963		29	1,154
Total		2070	3004	13334		757	19165

Table 44. NRC Sortie Data August 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		116	331			66	513
Caliente		35	560	1695		203	2,493
Coyote		62	92	1695		99	1,948
Elgin		84	775			177	1,036
Reveille		60	87	1695		73	1,915
R61		104	292			55	451
R62		115	329			66	510
R63		116	258			69	443
R64		82	290			54	426
R65		94	265			65	424
R71		68	85	1695		66	1,914
R74		50	96	1695		63	1,904
R75		56	84	1695		59	1,894
R76		68	89	1695		60	1,912
EC East		56	108	1695		61	1,920
EC West		56	101	1695		61	1,913
EC South		66	89	1695		44	1,894
R4808E		46	72	1695		34	1,847
R4808W							
Pahute Mesa		50	91	1692		57	1,890
R4809A		60	78	1695		41	1,874
Total		1,444	4,172	22,032		1,473	29,121

Table 45. NRC Sortie Data September 97 by Organization and Subdivision-- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		14	77			21	112
Caliente		55	482			310	847
Coyote		17	110			91	218
Elgin		64	409			245	718
Reveille		17	102			89	208
R61		11	71			25	107
R62		17	74			31	122
R63		31	51			72	154
R64		24	70			33	127
R65		17	96			45	158
R71		16	82			92	190
R74		22	106			65	193
R75		22	106			99	227
R76		16	98			97	211
EC East		15	116			97	228
EC West		16	106			99	221
EC South		16	98			93	207
R4808E		22	98			86	206
R4808W							
Pahute Mesa		22	98			88	208
R4809A		16	98			87	201
Total		450	2548			1865	4863

Table 46. NRC Sortie Data October 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		64	158			117	339
Caliente		244	614			390	1,248
Coyote		126	375			306	807
Elgin		160	500			285	945
Reveille		128	365			302	795
R61		59	186			106	351
R62		66	190			108	364
R63		71	153			90	314
R64		66	209			124	399
R65		66	225			134	425
R71		151	400			294	845
R74		122	365			302	789
R75		130	412			297	839
R76		136	412			298	846
EC East		125	401			309	835
EC West		125	405			307	837
EC South		133	411			302	846
R4808E		134	369			302	805
R4808W							
Pahute Mesa		130	405			305	840
R4809A		143	351			284	778
Total		2,379	6,906			4,962	14,247

Table 47. NRC Sortie Data November 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		19	96			110	225
Caliente		100	576			568	1,244
Coyote		87	506			583	1,176
Elgin		111	384			372	867
Reveille		88	507			592	1,187
R61		16	92			111	219
R62		16	87			100	203
R63		26	72			115	213
R64		20	76			118	214
R65		21	223			108	352
R71		96	510			582	1,188
R74		90	513			576	1,179
R75		90	510			579	1,179
R76		96	510			584	1,190
EC East		90	506			579	1,175
EC West		90	516			572	1,178
EC South		94	510			576	1,180
R4808E		90	508			581	1,179
R4808W							
Pahute Mesa		90	505			586	1,181
R4809A		89	485			569	1,143
Total		1,419	7,692			8,561	17,672

Table 48. NRC Sortie Data December 97 by Organization and Subdivision -- Range Group Scheduling

	Scheduling Organization						
Subdivision	561st	422th	57th	Red Flag	Green Flag	Other	Total
Alamo		29	639			1	669
Caliente		98	871			17	986
Coyote		137	732			17	886
Elgin		84	842			17	943
Reveille		146	720			16	882
R61		32	635				667
R62		32	635			1	668
R63		12	585			22	619
R64		29	629			6	664
R65		25	831			40	896
R71		163	734			17	914
R74		145	734			15	894
R75		150	732			18	900
R76		162	735			37	934
EC East		147	733			17	897
EC West		147	733			19	899
EC South		158	734			36	928
R4808E		135	708			12	855
R4808W							
Pahute Mesa		144	732			9	885
R4809A		125	728			10	863
Total		2,100	14,422			327	16,849

APPENDIX A.10

LAND DESCRIPTIONS

APPENDIX A.10

LAND DESCRIPTION

This appendix contains legal descriptions for the current NAFR land use including PLO 99-606, the Groom Mountain Withdrawal (PL 100-338), and White Sides Safety and Security Buffer (PLO 7131). Table A.10-1 provides a basis for the estimation of acreage disturbed within the existing NAFR. This information was used in determining the area directly affected by past and present use of the NAFR. Table A.10-2 provides a summary of the total acreage included in the current NAFR land and each of the alternatives evaluated in this LEIS.

Existing NAFR Legal Description:

Mount Diablo Meridian, Nevada

PL 99-606

Tps. 1, 2, 3, and 4, S., R. 44 E., All

T. 5 S., R. 44 E., partly unsurveyed, secs. 1-2:10-16 incl; 20-36 incl.

T. 6 S., R. 44 E., unsurveyed, All.

T. 7 S., R. 44 E., unsurveyed, secs. 1-5, incl; 8-16 incl; 22-26; 35; 36.

T. 8 S., R. 44 E., unsurveyed, sec. 1.

Tps. 1, 2, 3, and 4 S., R., 45 E., All.

Tps. 5, 6, and 7 S., R. 45 E., unsurveyed. All.

T. 8 S., R. 45 E., unsurveyed, secs. 1-18 incl; 20-27 incl; 35, 36.

Tps. 1 and 2 S., R. 46 E., All.

Tps. 3, 4, 5, 6, 7, and 8 S., R. 46 E., unsurveyed, All.

T. 9 S., R. 46 E., unsurveyed, secs. 1-6 incl; 8-15 incl; 23, 24.

Tps. 1 and 2 S., R. 47 E., All.

Tps. 3, 4, 5, 6, 7, and 8 S., R. 47 E., unsurveyed, All.

T. 9 S., R. 47 E., unsurveyed, secs, 1-30, incl; 33-36 incl.

T. 10 S., R. 47 E., secs. 1, 2, 12.

Tps. 1 and 2 S., R. 48 E., All.

Tps. 3, 4, 5, 6, 7, 8, and 9 S., 48 E., unsurveyed, All.

T. 10 S., R. 48 E., unsurveyed, secs. 1-17, incl;21-26 incl; 36

Tps. 1 and 2 S., R. 49 E., All.

Tps. 3, 4, 5, 6, and 7 S., R. 49 E., unsurveyed, All

T. 8 S., R. 49 E., unsurveyed, secs. 1-11 incl; 14-23 incl; 26-35 incl; secs. 12, 13, 24, 25, 36, excl of those portions w / d by PLO 2568.

T. 9 S., R. 49 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-35 incl; secs. 1, 12, 13, 24, 25, 36, excl of those portions w / d by PLO 2568.

T. 10 S., R. 49 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-35 incl; secs. 1, 12, 13, 24, 25, 36, excl of those portions w / d by PLO 2568.

T. 11 S., R. 49 E., unsurveyed, secs, 2-11 incl; 14-23 incl; 26-35 incl; secs. 1, 12, 13, 24, 25, 36, excl of those portions w / d by PLO 2568.

T. 12 S., R. 49 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-35 incl; secs. 1, 12, 13, 24, 25, 36, excl of those portions w / d by PLO 2568.

Tps. 1, 2, 3, 4, 5, 6, and 7 S., R. 50 E., unsurveyed, All.

T. 8 S., R. 50 E., unsurveyed, secs. 1-6 incl; secs. 7-12 incl; excl of those portions w / d by PLO 2568.

Tps. 2, 3, 4, 5, 6, and 7 S., R. 51 E., unsurveyed, All.

T. 8 S., R. 51 E., unsurveyed, secs. 1-6 incl; secs. 7-12 incl; excl of those portions w / d by PLO 2568.

Tps. 3 and 4 S., R. 51 1 / 2 E., unsurveyed, All.

Tps. 3, 4, 5, 6, and 7 S., R. 52 E., unsurveyed, All.

T. 8 S., R. 52 E., unsurveyed, secs. 1-6 incl; secs. 7-12 incl; excl of those portions w / d by PLO 2568 and 805.

Tps. 3 and 4 S., R. 53 E., All.

Tps. 5, 6, and 7 S., R. 53 E., unsurveyed. All.

T. 8 S., R. 53 E., unsurveyed, secs. 1-6 incl; secs 7-12 incl; excl of those portions w / d by PLO 805.

T. 3 S., R. 54 E., secs. 4-9 incl; 16-21 incl; 28-33 incl.

T. 4 S., R. 54 E., secs. 4-9 incl; 16-21 incl; 28-33 incl.

Tps. 5 and 6 S., R. 54 E., unsurveyed. All.

T. 7 S., R. 54 E., unsurveyed, secs. 1-34 incl; secs 35, 36, excl of those portions w / d by PLO 1662.

T. 8 S., R. 54 E., unsurveyed, secs. 3-6 incl; secs. 2, 7-11 incl, 35, 36, excl of those portions w / d by PLOs 805 and 1662.

T. 9 S., R. 54 E., unsurveyed, secs. 1, 12, 13, 24, 25, 36; secs. 2, 11, 14, 23, 35, excl of those portions w / d by PLO 805.

T. 10 S., R. 54 E., unsurveyed, secs. 1, 12, 12, 24, 25, 36; secs. 2, 11, 14, 23, 26, 35, excl of those portions w / d by PLO 805.

T. 11 S., R. 54 E., unsurveyed, secs. 1, 12, 13, 24, 25, 36; secs. 2, 11, 14, 23, 26, 35, excl of those portions w / d by PLO 805.

T. 12 S., R. 54 E., unsurveyed, secs. 1, 12, 13, 24, 25, 36; secs. 2. 11, 14, 23, 26, 35, excl of those portions w / d by PLO 805.

T. 13 S., R. 54 E., unsurveyed, secs. 10-15 incl; 22-27 indl; 34-36 incl; secs. 9, 16, 21, 28, 33, excl of those portions w / d by PLO 805.

T. 14 S., R. 54 E., unsurveyed, secs. 1-3 incl; 10-15 incl; 22-27 incl; 34-36 incl; secs 4, 9, 16, 21, 28, 33, excl of those portions w / d by PLO 805.

T. 16 S., R. 54 E., secs. 1-3, N1 / 2, incl; sec. 4, NE1 / 4.

T. 5 S., R. 55 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-35 incl.

T. 6 S., R. 55 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-35 incl.

T. 7 S., R. 55 E., unsurveyed, secs. 2-11 incl; 14-23 incl; 26-30 incl; secs. 31-35 incl, excl of those portions w / d by PLO 1662; sec. 36, S1 / 2, excl of those portions w / d by PLO 1662.

T. 8 S., R. 55 E., unsurveyed, secs. 31-36 incl, excl of those portions w / d by PLO 1662.

Tps. 9, 10, 11, 12, 13, and 14 S., R. 55 E., unsurveyed. All.

T. 16 S., R. 55 E., secs. 1-6, N1 / 2, incl.

T. 7 S., R. 55 1 / 2 E., unsurveyed, secs. 31-33, S 1 / 2, incl, excl of those portions w / d by PLO 1662.

T. 8 S., R. 55 1 / 2 E., unsurveyed, secs. 4, 9, 16, 21, 28, 31-33 incl, excl of those portions w.d by PLO 1662.

Tps. 9, 10, 11, 12, 13, 14, and 15 S., R. 55 1 / 2 E., unsurveyed. All.

T. 16 S., R. 55 1 / 2 E., secs, 1, 2, N1 / 2.

Tps. 8, 9, 10, 11, 12, 13, and 14 S., R. 56 E., unsurveyed. All.

T. 15 S., R. 56 E., All.

T. 16 S., R. 56 E., secs 1 and 2, All; Sec. 3, lots 5, 6, 7, 8, 9, E1 / 2; sec. 4, lots 5, 6, 7, 8; sec. 5, lots 5, 6, 7, 8, 9, NW1 / 4, W1 / 2 NE 1 / 4; sec. 6, lots 8, 9, NE1 / 4, W1 / 2; sec. 8, lot 1; sec. 9, lot 1; tracts 38, 39, 40, 41, 42 A, B and C.

Tps. 8, 9, 10, 11, 12, 13, 14, and 15 S., R. 57 E., unsurveyed. All.

T. 16 S., R. 57 E., unsurveyed, secs. 1-6 incl; sec. 7, NE1 / 4; secs 8-16 incl; sec. 17, NE1 / 4; sec. 20, SE1 / 4 SW1 / 4, S1 / 2 SE1 / 4; sec. 21, NE1 / 4, SW1 / 4 SW1 / 4; secs. 22-26 incl; sec. 27, NE1 / 4; sec. 28, NW1 / 4 NW1 / 4; sec. 29, N1 / 2 NE1 / 4; NE1 / 4 NW1 / 4; sec. 35, NE 1 / 4; sec. 46, All.

Tps. 8, 9, 10, 11, 12, 13, 14, and 15 S., R. 58 E., unsurveyed. All.

T. 16 S., R. 58 E., unsurveyed, secs. 1-10 incl; 15-22 incl; 27-34 incl.

T. 17 S., R. 58 E., secs. 1-4 incl; sec. 5, NE1/4; sec. 9, NE1/4; sec. 10 N1/2; N1/2 SW1/4, SE1/4 SW1/4, SE1/4; secs. 11, 12; sec. 13, NW1/4; sec. 14, N1/2, NE1/4 SW1/4, SE1/4; sec.15, NE1/4 NE1/4.

Tps. 8, 9, 10, 11, 12, 13, and 14 S., R. 59 E., unsurveyed. All.

GROOM MOUNTAIN RANGE WITHDRAWAL AREA (PLO 100-338)

T.5 S., R. 55 E., secs. 1, 12, 13, 24, 25, 36

T.6 S, R. 55 E., secs 1, 12, 13, 24, 25, 36

T.7 S., R. 55 E., secs 1, 12, 13, 24, 25; sec 36 exclusive of land in PLO 1662

T.5 S, R. 55, 1/2 E., sec. 6 exclusive of mineral patent 9368; secs 7, 8, 16 through 21, 28 through 33

T.6 S, R. 55, 1/2 E

T. 7 S., R. 55 1/2 E, secs 4, 6, 7, 9, 16, 18 through 21, 28 through 30; secs 5, 8 exclusive of mineral patents 1660, 1661, 1034979; sec 17 exclusive of mineral patent 1055957; secs 31 through 33 exclusive of land PLO in 1662

T.5 S., R. 56 E, secs 19, 27 through 35; sec 20 exclusive of mineral patent 3379

T.6 S., R. 56 E, secs 2 through 11, 14 through 23, 26 through 35

T.7 S., R 56 E, secs 2 through 11, 14 through 23, 26 through 35

WHITE SIDES SAFETY & SECURITY BUFFER (PLO 7131)

In addition to the above land is the recent White Sides withdrawal of approximately 3,972 acres, which is defined as follows:

T. 6 S., R. 56 E., unsurveyed, secs. 25 and 36.

T. 7 S., R 56 E., unsurveyed, sec. 1; sec. 13, W1/2; sec. 24, NW1/4.

T. 6 S., R 57 E., sec. 30, lots 1 thru 4, E1/2 W1/2; sec. 31, lots 1 thru 4, E1/2 W1/2, E1/2.

T. 7 S., R 57 E., sec. 6 lots 1 thru 7, S1/2 NE1/4, SE1/4 NW1/4, E1/2 SW1/4, SE1/4.

Table A-10.1 NELLIS AIR FORCE RANGE — LAND DISTURBANCE SUMMARY

Location	*Acres*	*Subtotals*	*Data*	*Assumption*	*Reference*
NORTH RANGE					
Tonopah Test Range		2,890			
DOE Facilities	624				NAFR Land Use Report
TTR Airfield	2157				USAF Real Property Report
Mancamp	109				USAF Real Property Report
Tolicha Peak	23	23			USAF Real Property Report
TECR	18.1	18			99RANSS/RSF
Green Flag Village	10	10			99RANSS/RSF
Roads		2,460			
70s Ranges trails	561		462.5mi	10 ft	RMO GIS
70s Ranges Improved Roads	1,653		272.8mi	50 ft	RMO GIS
EC South trails	133		109.8mi	10 ft	RMO GIS
EC South Improved Roads	113		18.8mi	50 ft	RMO GIS
Threat Simulators	31	31	133 sites	100 X 100	99RANS/DOE
Targets		34,186			
Individual Targets	31748.3		1025 sites		99 RANS/DOM
Airfield	1600		5 ea	1 X .5 mi	
Convoy	11.5			1000 X 500	
Strafing	826		100 ea.	600 X 600	
DOE Activities & Facilities		16,155			
Project 57	268				DOE/NV ER
Cabriolet/Palanquin	157				DOE/NV ER
Clean Slates 1	13				DOE/NV ER
Clean Slates 2	35				DOE/NV ER
Clean Slates 3	125				DOE/NV ER
Double Tracks	13				DOE/NV ER
Schooner	486				DOE/NV ER
Emplacement Holes	75		3 holes	25 acres each	
Central Pahute Mesa	8000		64 test cavities		
Western Pahute Mesa	2250		18 test cavities		
TTR Bomblet Target Area	3200				DOE/NV
TTR Industrial Sites	18		18 sites	1 acre each	DOE/NV
Pahute Mesa Roads	1515		250 miles	50 ft wide	
NORTH RANGE SUBTOTAL		**55,773**			
SOUTH RANGE					
Pt. Bravo	7.1	7			99RANSS/RSF
Indian Springs AFAF	2300	2300			USAF Real Property Report
Silver Flag Alpha	53.7	54			99RANSS/RSF
Roads		3426			
60s Ranges trails	508		418.7mi	10 ft	RMO GIS
60s Ranges Improved Roads	953		157.3mi	50 ft	RMO GIS
4809A trails	470		387.7mi	10 ft	RMO GIS
4809A Improved Roads	1,495		246.6mi	50 ft	RMO GIS
Toss Towers (0.01 acres total)	0	1	22 sites	100 sf	99RANS/DOE
Targets	8672.7	8673		280 sites	99 RANS/DOM
DOE ER Areas					
Small Boy	130	130			DOE/NV ER
SOUTH RANGE SUBTOTAL		**14,591**			
TOTAL NAFR DISTURBED AREA		***70,364***			

Note: The DOE contaminated areas have not been characterized, in whole or in part, and the information provided refers only to the background level and was intended to be used only for land area impact purposes and has no relation to clean-up standards, health standards, or risk analysis.

Table A-10.2 NELLIS AIR FORCE RANGE - LAND AREA SUMMARY				
	Subject Lands	*Reference*	*Year*	*Affected Area (Acres)*
1	Nellis Air Force Range	P.L. 99-606, Military Lands Withdrawal Act	1986	2,945,726
2	Groom Mountain Extension	P.L. 100-338	1988	89,000
3	White Sides Safety & Security Buffer	Public Land Order 7131	1995	3,972
4	Proposed Non-renewal	Cactus Springs Finger	1995	3,056
5	Proposed Administrative Transfer	Public Land Order 1662	2001	38,400
6	Proposed Non-renewal	NAFR Southwestern Boundary	2001	34,768(1)(2)
7	Proposed Administrative Transfer	Pahute Mesa	2001	127,620(1)
	LEIS Alternatives Summary	*Subject Lands*		
	Current NAFR	1 + 2 + 3		3,038,698
	Alternative 1A	1 + 2 + 3 - 4		3,035,642
	Alternative 1B	1 + 2 + 3 - 4 + 5 - 6 - 7		2,911,654
	Alternative 2A	1 + 2 + 3 - 4		3,035,642
	Alternative 2B	1 + 2 + 3 - 4 + 5 - 6 - 7		2,911,654

Notes: (1) Approximate acreage based on whole sections. This value could be further refined prior to Congressional action.
(2) The final acreage is expected to be between 30,000 and 35,000 acres.

Appendix B
STATEMENT OF PUBLIC PARTICIPATION DOCUMENT

APPENDIX B

STATEMENT OF PUBLIC PARTICIPATION

1.0 INTRODUCTION

This document presents a summary of the public participation efforts associated with the Nellis Air Force Range (NAFR) renewal environmental impact analysis process (EIAP). It has been prepared in accordance with federal regulations (43 CFR 2310.3-2) pertaining to development and submittal of the land withdrawal case files. The regulations were developed pursuant to Section 204(10) of the Federal Land Policy and Management Act of October 1976 (FLPMA), which states that lands suggested for withdrawal must be reviewed.

Many opportunities are available for public participation in the NAFR renewal EIAP. These include:

- scoping sessions and comment period;
- receipt of and comment on newsletters;
- participation in community group meetings or agency consultation; and
- public hearings and comment period.

2.0 SCOPING PROCESS

The scoping period for the EIAP began when the Notice of Intent was published in the *Federal Register* on 30 May 1996. The closing date for the scoping period was set for 5 August 1996. Although the receipt of public comments is most useful during the early stage of the EIAP, the Air Force stated during the scoping sessions that they would welcome comments throughout the Legislative Environmental Impact Statement (LEIS) analysis and preparation process.

The Air Force's intent during the scoping process was to provide the greatest level of opportunity for government agencies, special interest groups, and the general public to learn about the Air Force's proposal and to offer several ways for those interested to express their thoughts regarding the proposal. Display ads and press releases announcing the scoping sessions were placed in local newspapers in these locations:

- Indian Springs
- Caliente
- Las Vegas
- Beatty
- Tonopah
- Reno

Public service announcements were also aired on regional radio and television stations.

The scoping sessions were designed in an "open house" format to create a comfortable atmosphere for attendees — one in which participants could speak individually to Air Force personnel. During the sessions, attendees were encouraged to ask questions and provide input. Following the initial "open house" portion of the session, senior Air Force officers presented an overview of the NAFR and the LEIS process. Attendees were then invited to identify issues of concern. These were recorded by a court reporter.

At the front door of every scoping session location, Air Force personnel were available to greet attendees and guide them in the right direction once inside the building.

Four principal displays were developed with key messages and information to help people understand the NAFR Renewal process. The displays were arranged so that attendees were presented information in a specific order as they progressed to each display.

There were three methods of commenting available to the public during the scoping sessions. Attendees could provide the following:

1. give verbal testimony to a court reporter;
2. hand in written comments they brought with them to the scoping session or complete a written comment form provided by the Air Force;
3. personally type in comments at one of the available computers or have Air Force personnel type the comment (comments were printed out immediately upon completion and were signed by the commentor).

Scoping sessions were held at locations throughout Nevada in support of the NAFR renewal proposal. The schedule for the scoping sessions and attendance is presented in Table B-1.

Table B-1 Schedule of Sessions and Attendance

Date	*Location*	*Attendance*
June 17, 1996	Indian Springs, Nevada	15
June 18, 1996	Caliente, Nevada	8
June 20, 1996	Las Vegas, Nevada	13
June 24, 1996	Beatty, Nevada	9
June 25, 1996	Tonopah, Nevada	3
June 26, 1996	Reno, Nevada	26

Written and oral comments received from the general public, special interest groups, and government agencies during the comment period were reviewed to summarize the scope of

comments and attendance. This review was documented and included in a formal briefing that was presented to participating individuals within the Air Force, USFWS, and the BLM to identify issues to be addressed in the Draft LEIS. The presentation was based on all oral and written comments submitted. In total, 85 comments were received at the scoping sessions; 3 comments were received via the Internet; and 29 written comments were received via mail.

3.0 PUBLIC COMMENT PERIOD

The public comment period began on October 2, 1998, as identified in the Notice of Availability for the Draft LEIS that was published in the *Federal Register*. It concluded 90 days later, on 31 December 98. During the comment period the Air Force held public hearings to receive formal public comments on the Draft LEIS. A schedule for the public hearings and attendance is presented in Table B-2.

Table B-2 Schedule of Public Hearings and Attendance

Date	*Location*	*Attendance*
November 9, 1998	Indian Springs	22
November 10, 1998	Las Vegas	35
November 11, 1998	Caliente	17
November 12, 1998	Pahrump	14
November 13, 1998	Beatty	11
November 16, 1998	Tonopah	20
November 17, 1998	Reno	41

The purpose of the public hearings was to permanently record relevant oral comments regarding the Draft LEIS from government agencies, commercial and private organizations, and the public.

As part of the National Environmental Policy Act process, Executive Order 13007 requires government-to-government consultation with tribes with ancestral ties to NAFR. To that end, the Air Force held a Native American Interaction Program meeting during the public comment period to allow the interested American Indians an opportunity to comment.

The Air Force used a variety of medium to advertise the public comment period and associated public hearings, including print and electronic media. Fliers were delivered and posted at local post office and community centers, where available in Caliente, Pioche, Alamo, Rachel, Pahrump, Beatty, Indian Springs, Hiko, and Goldfield; print ads were placed in the *Las Vegas Review-Journal*, *Ely Daily Times*, *Pahrump Valley Gazette*, *Tonopah Times*, and *Gazette-Journal*; radio advertisements were placed on local radio, and news releases were sent to both the print and electronic media, including radio and television stations in the communities surrounding the

NAFR. In addition, the October 1998 newsletter included a timeline of the comment period and public hearing dates and locations.

Copies of the Draft LEIS were mailed to all agencies, organizations, and individuals who expressed an interest in receiving a copy during the scoping period. The mailing list also included local government officials and local, state, and federal regulatory agencies with potential areas of responsibility. The Draft LEIS was also made available for review at various repositories and libraries located throughout Nevada. These locations included the Beatty Library; Caliente Library; Carson City Library; Indian Springs Library; Las Vegas Clark County Library; Lincoln County Library; Pahrump Library; Reno Library, Reno; U.S. Bureau of Land Management Tonopah Commissioner's Office; UNLV library; and University of Nevada Reno Library. The Air Force's intention was to give the public every opportunity to familiarize itself with the document prior to each hearing.

In addition to formal oral comments, the public was also invited to submit written comments at the hearing locations or through the mail.

4.0 NEWSLETTERS

A mailing list was developed from the names and addresses collected during the scoping period. The sources included the following:

- scoping meeting attendance sheets;
- written and oral comment forms;
- return postcards from the newsletters; and
- letters received requesting that the sender be placed on the mailing list.

The list was augmented with the names of interested agencies and groups. This effort was led by public affairs personnel at Nellis AFB.

The goal of maintaining communication with people on the mailing list was accomplished through a series of newsletters. The newsletters were prepared at specific times during the environmental process and the text written to correspond with the current stage of the EIAP.

Each newsletter includes a timeline for the EIAP, with the appropriate segment highlighted. A contact name is always provided, along with an address and phone number, for any questions or comments. A self-addressed, postage-paid response card is also a regular feature of the newsletters. Specific questions are asked on each response card providing an additional opportunity for these and other comments to be sent directly to the Air Force. Approximately 1,000 copies of each newsletter were distributed to those people on the mailing list and also through Nellis AFB.

5.0 PARTICIPATION IN COMMUNITY GROUP MEETINGS OR AGENCY CONSULTATION

Prior to publication of the Notice of Intent, the Air Force sought input on the proposal and the EIAP from numerous groups and agencies. The 99th Wing also met with interest groups and state and federal agencies throughout southern Nevada. These presentations and discussions have continued since the publication of the Notice of Intent, throughout the scoping process, and will continue throughout the EIAP process. In addition to informal meetings and presentations on the proposal, there was also formal consultation. Chapter 10.0 of the Draft LEIS provides a list of repositories.

6.0 CONCLUSION

The public participation opportunities for the NAFR LEIS were designed to fulfill the requirements of NEPA and FLPMA. The Air Force's intent was to go beyond the basic requirements of these two laws and provide the highest level-of-effort to make sure everyone interested in the NAFR renewal proposal was given a chance to review the information, ask questions and discuss concerns, and provide comments.

Appendix C
RELEVANT FEDERAL, STATE, AND LOCAL STATUTES, AGREEMENTS, AND GUIDELINES DOCUMENT

APPENDIX C

RELEVANT FEDERAL, STATE, AND LOCAL STATUTES, REGULATIONS, AGREEMENTS, AND GUIDELINES

GENERAL

Air Force Instruction (AFI) 32-7061 (Environmental Impact Analysis Process) is the Air Force implementation of the procedural provisions of the NEPA and CEQ regulations.

Executive Order 12856 (Right to Know Laws and Pollution Prevention Requirements) directs all federal agencies to reduce and report toxic chemicals entering any wastestream; improve emergency planning, response, and accident notification; and encourage clean technologies and testing of innovative prevention technologies. The executive order also provides that federal agencies are persons for purposes of The Emergency Planning and Community Right-to-Know Act (Superfund Amendments and Reauthorization Act [SARA] Title III), which obliges agencies to meet the requirements of the Act.

Executive Order 12898 (Environmental Justice) directs federal agencies to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations in the United States and its territories and possessions. The order creates an Interagency Working Group on Environmental Justice and directs each federal agency to develop strategies within prescribed time limits to identify and address environmental justice concerns. The order further directs each federal agency to collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human health, or economic effect on the surrounding populations, when facilities or sites become the subject of a substantial federal environmental administrative or judicial action and to make such information publicly available.

Executive Order 12372 (Intergovernmental Review of Federal Programs) directs federal agencies to "make efforts to accommodate state and local elected officials' concerns with proposed . . . direct federal development." It further states, "for those cases where the concerns cannot be accommodated, federal officials shall explain the bases for their decision in a timely manner." The executive order requires federal agencies to provide state and local officials the opportunity to comment on actions that could affect their jurisdictions, using state-established consultation processes when possible.

Federal Land Policy and Management Act (FLPMA) of 1976 defines the mission of the Bureau of Land Management (BLM) and requires the BLM to inventory and manage all resources within the lands it administers.

National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 U.S.C. 4347, as amended) requires federal agencies to take the environmental consequences of proposed actions into consideration in their decisionmaking process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process.

AIRSPACE

Federal Aviation Act of 1958 created the Federal Aviation Administration (FAA) and charged the FAA Administrator with ensuring the safety of aircraft and the efficient utilization of the National Airspace System, within the jurisdiction of the United Sates.

FAA Handbook 7400.2C prescribes policy, criteria, and procedures applicable to rulemaking and non-rulemaking actions associated with airspace allocation and utilization, obstruction evaluation and marking airport airspace analyses, and the establishment of air navigation aids.

FAA Handbook 7110.65 prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.

Federal Aviation Regulation (Part 71) (1975) delineates the designation of federal airways, area low routes, controlled airspace, and navigational reporting points.

Federal Aviation Regulation (Part 73) (1975) defines special use airspace and prescribes the requirements for the use of that airspace.

Federal Aviation Regulation (Part 91) (1990) describes the rules governing the operation of aircraft within the United Sates.

NOISE

Executive Order 12088 (Federal Compliance with Pollution Control Standards) (1978) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution, including noise pollution, with respect to federal facilities and activities under the control of the agency.

Federal Interagency Committee on Urban Noise (1980) defines noise levels for various land uses and may result in areas that will not qualify for federal mortgage insurance. Additional sections allow for noise attenuation measures that are often required for HUD approval.

SAFETY

AFI 13-201 establishes practices to decrease disturbances from flight operations and protect the public from the hazards and effects associated with flight operations.

AFI 11-206 prohibits Air Force pilots from intentionally allowing any object to be dropped from an aircraft, except in an emergency, without prior approval. Approval is only given when the dropped object will not create a hazard to people, property, or other air traffic.

AFI 13-212 and Nellis Supplement 1 outline procedures governing weapons range use of chaff and flares.

AFI 11-214 delineates procedures for chaff and flare employment.

*Air Combat Command Supplement 1 to AFI 11-214 (*February 25, 1997*)* prescribes a minimum flare release altitude of 2,000 feet AGL over non-government-owned or controlled areas.

AFI 13-212 (Vol. 1, Vol. 2, Vol. 3) establishes procedures for the planning, construction, design, operation, and maintenance of weapons ranges. This AFI defines criteria for target placement, weapons safety footprints, and buffer zones as well as safety procedures involving aircraft or ordnance malfunctions.

AFI 32-2001 defines the requirements for Air Force installation fire protection programs, including equipment, response times, and training.

AFI 91-301 contains Air Force occupational safety, fire prevention, and health regulations governing a wide range of activities and procedures associated with safety in the workplace.

Air Force Manual 91-201 regulates and provides procedures for explosives safety and handling. This manual defines criteria for quantity distances, clear zones, and facilities associated with ordnance.

Department of Defense (DOD) Flight Information Publication indicates locations of potential hazards (e.g., bird aggregations, obstructions) and noise sensitive locations under military airspace, and defines horizontal and/or vertical avoidance measures. This publication is updated monthly to present current conditions.

DOD Instruction (DODI) 6055.1 contains occupational health guidance for managing and controlling exposure to radio frequency reduction.

HAZARDOUS MATERIALS

Federal Statutes and Regulations

AFI 32-1052 (Facility Asbestos Management) (March 1994*)*

AFI 32-1053 (Pest Management Program) (May 1994)

AFI 32-4002 (Hazardous Material, Emergency Planning and Response Program) (December 1997)

AFI 32-7020 (The Environmental Restoration Program) (May 1994)

AFI 32-7042 (Solid and Hazardous Waste Compliance) (May 1994*)*

AFI 32-7044 (Storage Tank Compliance) (May 1994)

AFI 32-7080 (Pollution Prevention Program) (May 1994)

AFI 32-7086 (Hazardous Material Management) (August 1997*)*

AFI 40-201 (Managing Radioactive Materials in the USAF) (July 1994*)*

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and SARA of 1986 provide liability and compensation for cleanup and emergency response from hazardous substances discharged into the environment and the cleanup of hazardous disposal sites.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (as amended in 1988) addresses the applications and disposal of pesticides and pesticide containers.

Hazardous and Solid Waste Amendments (HSWA) of 1984 significantly expanded the scope and requirements of Resource Conservation and Recovery Act *(*RCRA) and mandated the underground storage tank (UST) regulations.

Hazardous Materials Transportation Act (HMTA) of 1975 (Title I Section 101) established criteria for shippers and carriers that manage hazardous materials and includes training and qualifications of persons handling hazardous materials.

Occupational Safety and Health Administration (OSHA) Asbestos Standard (29CFR 1926.58) lists federal requirements during construction activities for handling and removal of asbestos from equipment and building structures. The chemical hazard communication program (29CFR 1910.120) requires the identification, information, and training on chemical hazards to be available to employees using hazardous materials and instituted material safety data sheets (MSDS) which provide this information.

Resource Conservation and Recovery Act (RCRA) of 1976 regulates storage, transportation, treatment, and disposal of hazardous waste that could adversely affect the environment.

Solid Waste Disposal Act (SWDA) and Amendments of 1980 amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

Toxic Substance Control Act (TSCA) of 1976 principally regulates polychlorinated biphenyls (PCBs) and asbestos-containing materials (ACM) in schools.

Nevada State Statutes and Regulations

Nevada Administrative Code 444, Sanitation (January 1997) contains guidance for the collection, storage, and disposal of solid waste; the rules and regulations on facilities and standards of practice for the management of hazardous waste; transportation requirements including manifesting and labeling; hazardous waste reduction; and recycling.

NAC 445A, Water Controls (January 1997) contains guidance for spill reporting, contamination of soils and corrective actions, groundwater protection, and permitting.

NAC 459, Hazardous Materials (September, 1996), addresses the safe storage and control of radioactive materials.

NAC 477, State Fire Marshal (November 1994) contains the requirements for containers for flammable or combustible liquids.

Title 40 Nevada Revised Statues, Public Health and Safety encodes the NACs on hazardous materials and solid waste, including hazardous wastes.

EARTH RESOURCES

Federal Statutes and Regulations

43 CFR 3000 Series pertains to mineral management including exploration and mining operations (43 CFR 3809).

BLM Manual 3031 sets standards for gathering and analyzing information on energy and mineral resources for BLM land use decisions.

Clean Water Act of 1977 (33 USC 251) specifically Section 404 regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers prior to such activities.

Common Varieties Act of 1955 governs sand, gravel, building stone, and similar materials.

Historic Sites Act of 1935 provides the basis for the establishment of national landmarks which represent "outstanding examples of landforms, geological features, etc., or fossil deposits."

Mineral Leasing Act of 1920 governs oil, gas and geothermal development. It provides for leasing of deposits of coal, phosphate, sodium, oil, oil shale, or gas, and lands containing deposits owned by the U.S.

Mining Law of 1872 authorizes hard rock mining (prospecting and extracting minerals) on public domain lands. It also sets the guidelines for staking mining claims on locatable mineral deposits (e.g., gold, silver, lead, asbestos, mica, fluorspar).

Nevada State Statutes and Regulations

NAC 519A provides regulations adopted by the Nevada Department of Business and Industry regarding the regulation of mining in Nevada.

WATER RESOURCES

Federal Statutes and Regulations

CERCLA of 1980 is the primary law that regulates remediation of environmental contamination.

Clean Water Act of 1977 (33 USC section 1251 et seq.) requires that any point source waste that discharges into waters of the U.S. requires a National Pollutant Discharge Elimination

System (NPDES) permit. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers prior to such activities.

Executive Order 11988 (Flood Plain Management) directs that "any federally undertaken, financed, or assisted construction project must provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This order requires each federal agency to determine whether the project will occur in a floodplain and to consider alternatives. If no practical alternative is found, it requires minimizing harm and notifying the public as to why the project must be located in the floodplain. It also provides for public review and comment.

Executive Order 11990 (Protection of Wetlands) (1977) requires that leadership shall be provided by involved agencies to minimize the destruction, loss, or degradation of wetlands. The order was issued to "avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands whenever there is a practicable alternative." Federal agencies are required to provide for early public review of any plans or proposals for new construction in wetlands.

Executive Order 12088 (Federal Compliance with Pollution Control Standards) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

Resource Conservation and Recovery Act (RCRA) of 1976 is the primary law regulating the handling of hazardous waste, which includes wastes generated during environmental cleanup.

Safe Drinking Water Act of 1974 (42 USC section 300f et seq.) requires the Environmental Protection Agency (EPA) to establish a program which provides for the safety of the nation's drinking water. Regulations under this act can be found in 40 CFR, section 141 et seq.

Underground Injection Control (UIC) Program (40 CFR Part 146) is a part of the Safe Drinking Water Act that establishes regulations for the injection of fluids into wells for storage or disposal which are designed to protect underground sources of drinking water.

Nevada State Statutes and Regulations

NAC, 445A, Water Controls (January 1997) regulates surface water quality and groundwater quality in Nevada, including regulation of existing and designated beneficial uses of surface water bodies and groundwater. This regulation: 1) sets the standards for drinking water, specifications for certification, and control of variances/exemptions; 2) sets standards and requirements for the construction of water wells and other water supply systems; 3) establishes the different classes (Class I through V), aquifer exemptions, prohibited wells, operation, monitoring, etc., as wells as plugging and abandonment activities; 4) establishes standards for surface water quality; and 5) specifies discharge permit requirements and notification requirements.

Nevada Revised Statute 533, Adjudication of Vested Water Rights; Appropriation of Public Waters, regulates surface water appropriations in Nevada, based on availability and seniority of appropriations. This statute sets forth the requirements, procedures, and process of acquiring a permit for the appropriation of public waters in Nevada. This statute also establishes the fees associated with the processing and issuing of permits and sets forth the environmental requirements.

Nevada Revised Statute 534, Underground Water and Wells, regulates groundwater appropriations in Nevada, based on perennial yield of each basin with special provisions for temporary appropriations and adjudication of overdrafted basins. The statute specifies the conditions, requirements, and rules for acquiring such water. Water well drilling standards are also included in this statute, including license requirements of well drillers; the requirements of drilling, construction, and plugging of wells; and the protection of aquifers from pollution and waste.

AIR QUALITY

Clean Air Act (Title 40 CFR parts 50 and 51), amended in August 1977 and November 1990, dictates that the National Ambient Air Quality Standards (NAAQS) must be maintained nationwide. The Act delegates authority to state and local agencies to enforce the NAAQS and to establish air quality standards and regulations of their own. The adopted state standards and regulations must be at least as restrictive as the federal requirements. Air pollution sources within the study area are regulated by the Nevada Department of Environmental Protection. Although mobile sources such as aircraft are exempt from air pollution permitting requirements, the operation of these sources must comply with state and federal regulation and the ambient air quality standard.

Section 169A of the Clean Air Act states that a national goal is to prevent any further impairment of visibility within federally mandated Class I areas such as National Parks and Wilderness Areas from man-made sources of air pollution. Visibility impairment is

defined as reduction in regional visual range or atmospheric discoloration or plume blight from exhaust effluents. Federal criteria to determine significant impacts on visibility within Class I areas exist for stationary emission sources, but do not pertain to mobile sources since they are generally exempt from permit review by regulatory agencies.

BIOLOGICAL RESOURCES

Federal Statutes and Regulations

AFI 32-7064 (Integrated Natural Resources Management) implements Air Force Policy Directive 32-70, Environmental Quality. This instruction explains how to manage natural resources on Air Force property in compliance with federal, state, and local standards in the U.S. and U.S. territories and possessions.

*Bald Eagle Protection Act (*16 USC 668-668d) addresses the protection of bald and golden eagles and specifies criminal penalties.

BLM Manual Chapter 6840 sets forth the policy of the BLM to conserve threatened and endangered species and ecosystems they depend upon, primarily by prescribing management for conservation of lands these species inhabit. Similarly, it is BLM policy to manage candidate species and their habitats to ensure that BLM actions do not contribute to the need to list any candidate species as threatened or endangered. It is also BLM policy to carry out management plans for the conservation of state-listed plants and animals. The State Director is to develop policies that will assist the state in achieving their management objectives for those species.

Clean Water Act of 1977 (33 USC 1251 et seq.) requires a NPDES permit for all discharges to reduce pollution that could affect any form of life. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers.

Endangered Species Act of 1973 (16 USC section 1531 et seq. as amended) protects proposed and listed threatened or endangered species. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) is required under Section 7 of the act for federal projects and all other projects that require federal permits (e.g., U.S. Army Corps of Engineers permits) where such actions could directly or indirectly affect any proposed or listed species.

Executive Order 11988 (Floodplain Management) (1977) requires that governmental agencies, in carrying out their responsibilities, provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains. This order requires

each federal agency to determine whether the project will occur in a floodplain and to consider alternatives. If no practical alternative is found, it requires minimizing harm and notifying the public why the project must be located in the floodplain, and it provides for public review and comment.

Executive Order 11990 (Protection of Wetlands) (1977) requires that governmental agencies, in carrying out their responsibilities, provide leadership and take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Each agency is to consider factors relevant to a project proposal's effect on the survival and quality of the wetlands by maintenance of natural systems, including conservation and long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, and wildlife. Agencies are required to provide for early public review of any plans or proposal for new construction in wetlands.

Executive Order 12088 (Federal Compliance with Pollution Control Standards) (1988) requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

Federal Cave Resources Protection Act of 1988 requires protection of significant caves on federal land and protects the flora and fauna within the caves. It establishes civil and criminal penalties for damaging or disturbing significant caves.

Fish and Wildlife Coordination Act (1934) (16 USC section 661 et seq.) requires the U.S. Army Corps of Engineers to consult with the USFWS and state wildlife agency or agencies on all permit applications for projects in waterways or wetlands under U.S. Army Corps of Engineers jurisdiction.

Fish and Wildlife Conservation Act (1980) promotes state programs to conserve, restore, and benefit non-game fish and wildlife and their habitat.

Migratory Bird Treaty Act of 1972 (16 USC sections 703 through 711) federally protects all birds including (but not limited to) hawks, eagles, falcons, shorebirds, wading birds, owls, waterfowl, and songbirds by limiting the transportation, importation, killing, or possession of those birds.

Rivers and Harbors Act of 1899 (sections 9 and 10, 33 USC section 1344) regulates all types of development in or over navigable water, including bridges, dams, dikes, piers, wharves, booms, weirs, jetties, dredging, and filling by requiring a U.S. Army Corps of Engineers permit for such actions. Navigable waters are defined in title 33 CFR section 329 to

include past, present, and potential future use in transporting commerce. Court decisions have expanded protection to estuaries and wetlands (Dederick 1984).

Wild Free Roaming Horse and Burro Act (1971). It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands. Public Law 92-195.

Nevada State Statutes and Regulations

NAC 503 (Hunting Fishing, and Trapping; Miscellaneous Protective Measures: Sections 010-104) specifies the classification of wildlife and also specifies protected and unprotected wildlife.

NAC 527 (Protection and Preservation of Timbered Lands, Trees, and Flora) provides for the broad protection of the indigenous flora of the state. Those plants, declared to be threatened with extinction, are placed on the state of Nevada's list of fully protected species.

CULTURAL RESOURCES

*AFI 32-7065 (Cultural Resources Management) i*mplements Air Force Policy Directive 32-70, Environmental Quality. This instruction sets guidelines for protecting and managing cultural resources in the United States and U.S. territories and possessions.

AF Manual 126-5 (Natural Resources, Outdoor Recreation, and Cultural Values) provides guidance, standards, and technical information on management of natural resources, outdoor recreational resources, and cultural resources.

AF Policy Letter (4 January 1982) establishes that it is Air Force policy to comply with historic preservation and other federal environmental laws and directives, including Historic Sites Act of 1935; NHPA of 1966, as amended; NEPA of 1969; Archaeological and Historic Preservation Act of 1974; ARPA of 1979; and Executive Order 11593.

American Indian Religious Freedom Act (AIRFA) (1978) (42 USC section 1996) states that it is the policy of the U.S. to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

Archaeological Resources Protection Act (ARPA) of 1979 (16 USC section 470aa-47011) ensures the protection and preservation of archaeological sites on federal or Native American lands.

Executive Order 11593 (1971) directs land-holding federal agencies to identify and nominate historic properties to the National Register and requires that these agencies should avoid damaging historic properties that might be eligible for the National Register.

Executive Order 13007 (1996) directs agencies responsible for managing federal lands to, "(1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites." The order also requires that reasonable notice is given for proposed actions or policies potentially restricting access to, or adversely affecting sacred sites.

Memorandum for the Heads of Executive Departments and Agencies regarding Government-to-Government Relations with Native American Tribal Governments directs each executive department and agency to: operate within a government-to-government relationship with federally recognized tribal governments; consult with tribal governments prior to taking actions affecting such governments; and assess the impact of plans, projects, programs and activities on tribal trust resources and assure that tribal rights are considered during consideration of such plans, projects, and programs.

National Historic Preservation Act (NHPA) of 1966 establishes National Register of Historic Places (National Register) and defines the Section 106 process requiring federal agencies to consider effects of an action on cultural resources on or eligible for the National Register.

Native American Graves Protection and Repatriation Act (NAGPRA) (1990*)* (25 USC 3001-3013) requires protection and repatriation of Native American cultural items found on, or taken from federal or tribal lands, and requires repatriation of cultural items controlled by federal agencies or museums receiving federal funds.

*Protection of Historic and Cultural Properties (*36 CFR section 800) (1986) provides an explicit set of procedures for federal agencies to meet their obligations under the NHPA and Executive Order 11593.

Nevada State Statutes and Regulations

Indian Burial Law (1989) (Nevada Revised Statutes [NRS] 383.150-383.190) protects Native American graves on private (including county) and public (state and federal) land. It provides procedures for consultation among landowner, state agencies and American Indian tribes, including treatment of the human remains and re-interment.

Additional NRSs: NRS 451.045 allows the local health officer to permit the removal of human remains. NRS 451.069-451.340 cover all aspects of moving cemeteries. NRS 452.305 and 206.125 prohibit destruction of or intentional damage to cemeteries, or property relating

to religious or educational purposes. NRS 440.085, NRS 440.420 and NRS 440.430 define the duties of various state and county officers in regard to human remains that are not of American Indians.

Non-Indian Historic Burials (NRS 451.030 and 451.020) protects all burials on private land, and under all circumstances not covered by antiquities legislation. NRS 451.030 also prohibits removal, receipt or purchase of human remains without authority of law. NRS 451.020 allows the transportation and distribution of recently cremated human remains anywhere the legal agent chooses.

Preservation of Prehistoric and Historic Sites, State of Nevada Antiquities Law (1959, 1979) *(*NRS) 381.195-381-227) sets the standards that guide archaeological research in Nevada, and requires an investigator on state or federal land to be the holder of a valid and current state permit.

LAND USE AND TRANSPORTATION

California Desert Protection Act of 1994 (108 Stat. 4471) gives National Park status to areas within the Mojave Desert.

Engle Act of 1958 (43 USC 155 et seq.) requires an Act of Congress to withdraw more than 5,000 acres for any one project planned by the DOD.

Grazing Administration-Exclusive of Alaska (43 CFR 4100 series) provides "uniform guidance for administration of grazing on the public lands" (exclusive of Alaska).

Highway Capacity Manual (Transportation Research Board) (1985)

Land and Interest Exchange (43 CFR 2200 series) "sets forth procedures for the exchange of public lands or interest" in public lands, for non-federal lands and interests in those lands.

Manual on Uniform Traffic Control Devices and Arterial Streets and Highways (American Association of State Highway and Transportation Officials [AASHTO]) (1988)

National Wild and Scenic Rivers Act of 1968 defines wild, scenic, and recreational rivers, designates a river classification, and establishes limits to development on shoreland areas.

Policy on Design of Urban Highways and Streets (AASHTO) (1990)

Resource Management Planning (43 CFR 1600 series) (1992) provides "a process for the development, approval, maintenance, amendment and revision of resource management plans and the use of existing plans for public lands administered by the BLM," under the authority of FLPMA (1976).

Use; Rights-of-Way (43 CFR 2800 series) establishes a procedure for reviewing and processing permits and applications concerning the granting of rights-of-way involving public lands.

Wilderness Act of 1964 requires a wilderness review of roadless areas to determine suitability for designation by Congress as a Wilderness Area.

RECREATION/VISUAL

BLM Recreation Opportunity Spectrum (1986) provides a framework to assess and manage the recreation resource of an area.

BLM Visual Resource Management Policy and Guidelines for Lands under Wilderness Review guides assessment and documentation for BLM lands under wilderness review.

National Wild and Scenic Rivers Act of 1968 defines wild, scenic, and recreational rivers, designates a river classification, and establishes limits to development on shoreland areas.

Recreation Management (43 CFR 8300 series) "sets forth procedure and practices for the management and use of public lands for specific kinds of public recreation activities, resource conditions, outdoor recreation occupancy, and resource development." Guidelines are also provided regarding access to public lands and limitations on travel across public lands.

Wilderness Act of 1964 requires a wilderness review of roadless areas to determine suitability for designation by Congress as a Wilderness Area.

Five-Party Cooperative Agreement

1 Dec 97

Purpose:

The purpose of this Five-Party Cooperative Agreement is to enhance management of the natural resources within the Great Basin and Mohave Desert ecosystems located on the Nellis Air Force Range (hereinafter "NAFR"), the Desert National Wildlife Range (hereinafter "DNWR"), and the Nevada Test Site (hereinafter "NTS"). The goal is to form a working group to foster a collaborative and complimentary approach to enhance management of this land and its ssociated resources using a biodiversity conservation and ecosystem-based approach among the following five agencies: Nellis Air Force Base (hereinafter "Nellis"), United States Fish and Wildlife Service (hereinafter "FWS"), Bureau of Land Management (hereinafter "BLM"), United States Department of Energy (hereinafter "DOE"), and the State of Nevada-Clearinghouse.

The BLM's Nellis Air Force Range Resource Plan, NAFR Integrated Natural Resource Management Plan, DNWR Natural Resource Management Plan, and NTS Resource Management Plan may be served best by a cooperative approach among the above five agencies to fully address the extent and complexity of the ecosystems involved.

Responsibilities:

1. Those NAFR lands coincidental with DNAA are used pursuant to the 1976 Memorandum of Understanding between Nellis and FWS which was mutually extended by letters, respectively dated 11 Mar 91 and 15 Mar 91, and currently under the guidance of Executive Order No. 12996, 25 Mar 96.

2. All parties agree to meet jointly, at least annually; to foster cooperation, consistency, and collaboration in land and resource management; however, additional meetings may be called with the concurrence of all parties.

3. All parties agree to conduct and attend an open public meeting, at least annually, during which the public may submit comments to any member or members of this agreement.

4. Nellis will host and chair both the first annual Five-Party meeting and the first annual Five-Party public meeting; thereafter, both annual meetings will alternate among the parties.

5. All parties will fund their respective costs incurred under this Agreement.

This Agreement becomes effective when signed by all the parties.

RUSSELL T. BOLT
Colonel USAF
Commander, Nellis AFB

12 NOV 1997
Date

MICHAEL F. DWYER
District Manager, Las Vegas District
Bureau of Land Management

11/14/97
Date

KENNETH W. VOGET
Project Leader
U.S. Fish & Wildlife Service

11/18/97
Date

GERRY W. JOHNSON
Manager Nevada Operations Office
Department of Energy

11-13-97
Date

JULIE BUTLER
State of Nevada Clearinghouse

11/17/97
Date

Appendix D
NOTICE OF INTENT DOCUMENT

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR WARFARE CENTER (ACC)
NELLIS AIR FORCE BASE, NEVADA

28 May 1996

HQ AWFC/CC
4370 N Washington Ave Ste 117
Nellis AFB NV 89191-7076

Mr Robert W Smith
Science Applications International Corp.
3900 Paradise Road
Las Vegas NV 89109

Dear Mr Smith

As you are aware, the Military Lands Withdrawal Act of 1986 allows Nellis the use of approximately 3.1 million acres of land in Southern Nevada for military operations. The use of this land has to be renewed by the year 2001.

The Range Renewal process unofficially began with six "neighborhood dialogues" designed to inform the public about Nellis Air Force Base activities as well as the Range Renewal process. The next step is the release of the Notice of Intent which outlines our proposed action and alternatives. The NOI will be published in the Federal Register on May 31, 1996.

Attached is a copy of the NOI for your information. If you have any questions, please contact the Public Affairs Office at 652-2750 or the Range Renewal Office at 652-3559.

We look forward to working with you as we continue through this very important process.

Marvin R. Esmond

MARVIN R. ESMOND
Major General
Commander

Attachment:
1. Notice of Intent

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

NOTICE OF INTENT

TO PREPARE A LEGISLATIVE ENVIRONMENTAL IMPACT STATEMENT FOR

NELLIS AIR FORCE RANGE (NAFR) RENEWAL, NEVADA

The United States Air Force (Air Force) will prepare a legislative environmental impact statement (LEIS) to assess the potential environmental impacts of renewal of the Nellis Air Force Range (NAFR), Nevada. The LEIS will be prepared in accordance with the National Environmental Policy Act (NEPA).

The current land withdrawal and reservation of the NAFR was established by the Military Lands Withdrawal Act of 1986 (Public Law 99-606) for the period ending on November 6, 2001. The Act provides that the Air Force may seek renewal of the NAFR withdrawal, in connection with which the Secretary of the Air Force will publish a legislative EIS addressing legislative alternatives and the effects of continued withdrawal.

The purpose of the proposed NAFR renewal is to retain a military training and testing range essential to near- and long-term preparedness of United States air forces. Renewing the land withdrawal will provide for the continued effective implementation of ongoing training and testing missions while maintaining the flexibility to adapt to the training needs of new technologies as they develop. The performance of air operations in combat is directly related to the quality and depth of training. NAFR provides a combination of attributes that serve this training requirement, including the following: favorable location and flying weather; sufficient land and airspace; diverse terrain; and developed training support facilities.

A range of alternatives, including the No Action alternative required by NEPA, will be considered. Three alternatives are described below.

Proposed Action: Renew Nellis Air Force Range withdrawal and reservation for an indefinite period of time with Congressional review every 15 years. The existing land withdrawal and reservation, consisting of approximately 3.0 million acres, would be reauthorized for an indefinite period of time. The land would be reserved by Congress for use by the Air Force for an armament and high-hazard test area; training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and other defense-related purposes. Every 15 years Congress would review the Air Force's continuing military need for the land, the environmental effects, and the needs of competing uses for the land and could adjust, if warranted, the terms and conditions of the withdrawal. Without limiting the priority use by the Air Force, the land would be managed in part by the Bureau of Land Management and in part by the U.S. Fish and Wildlife Service. Specifically, the Bureau of Land Management would manage approximately 2.2 million acres of the NAFR pursuant to the Federal Land Policy and Management Act of 1976 and other applicable laws. The remaining 826,000 acres of the NAFR are within the Desert National Wildlife Refuge and would be managed by the Fish and Wildlife Service pursuant to the National Wildlife Refuge System Act of 1976.

Alternative A: Renew the existing NAFR land withdrawal and reservation for 25 years. The existing land withdrawal and reservation, consisting of approximately 3.0 million acres, would be reauthorized for a specified term of 25 years, rather than for an indefinite time with periodic reviews. Otherwise, this alternative is like the Proposed Action.

No Action Alternative: No renewal of the NAFR land withdrawal and reservation. The land would not be reserved for use by the Air Force. The lands within the existing NAFR boundary would be managed by the Bureau of Land Management and the Fish and Wildlife Service under existing authorities. The No Action alternative would result in the fragmentation or cancellation of training missions accomplished at the NAFR. DOD would prepare appropriate environmental documentation to obtain Federal Aviation Administration approval to reclassify the existing restricted airspace to a Military Operation Area (MOA). This would allow for air-to-air training operations to continue, but would preclude air-to-ground training missions.

To provide a forum for interested parties to provide comments on the scope of the LEIS, a series of scoping meetings will be held in six Nevada communities. In addition, written comments will be accepted throughout the scoping period. Written comments should be forwarded to the address below by August 5, 1996. Scoping meetings will be held at the following times and locations.

1. Indian Springs, NV, June 17, 1996, 6:00 PM to 9:00 PM.
2. Caliente, NV, June 18, 1996, 6:00 PM to 9:00 PM.
3. Las Vegas, NV, June 20, 1996, 6:00 PM to 9:00 PM.
4. Beatty, NV, June 24, 1996, 6:00 PM to 9:00 PM.
5. Tonopah, NV, June 25, 1996, 6:00 PM to 9:00 PM.
6. Reno, NV, June 26, 1996, 6:00 PM to 9:00 PM.

Please direct written comments concerning the NAFR Renewal LEIS to:

Colonel Michael F. Fukey
Nellis Air Force Base
P. O. Box 9919
Las Vegas, NV 89191-0919

If you have any questions or require additional information, please contact Major Jeff Shea at (702) 652-4354.

PATSY J. CONNER

Air Force Federal Register Liaison Officer

Appendix E
NOISE ANALYSIS

APPENDIX E
AIRCRAFT NOISE ANALYSIS

1.1 GENERAL

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of minute vibrations which travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (for example, music) or unpleasant (for example, aircraft noise) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics − intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is sound frequency which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds that can be detected comfortably by the human ear have intensities which are 1,000,000,000,000 times larger than those of sounds which can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition". The latter term arises from the fact that what we are really doing when we add decibel values is first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

An important facet of decibel addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level. Because of the logarithmic units, the time-average sound level is dominated by the louder levels which occur during the averaging period. As a simple example, consider a sound level which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

The minimum change in the time-average sound level of individual events which an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound *intensity* but only a 50 percent decrease in perceived *loudness* because of the nonlinear response of the human ear (similar to most human senses).

Sound frequency is measured in terms of cycles per second (cps), or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies in the 1000 to 4000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the

abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A). In this document, all levels are A-weighted and are reported in dB, unless otherwise indicated.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common − one second and one-eighth of a second. A measured sound level averaged over one second is called a slow response sound level; one averaged over one-eighth of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

1.2 NOISE METRICS

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity which quantitatively measures the *effect* of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics. Recently, however, various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the Department of Defense and the Federal Aviation Administration have specified those which should be used for federal aviation noise assessments. These metrics are as follows.

1.2.1 Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM, L_{max} or L_{Amax}. The maximum sound levels of typical events are shown in Table E-1. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

1.2.2 Sound Exposure Level

Individual time-varying noise events have two main characteristics − a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or L_{AE}) combines both of these characteristics into a single metric.

Table E-1
Typical Sound Levels Measured in the Environment

At a Given Distance from Noise Source	*A-Weighted Sound Level in Decibels*	*Noise Environments*	*Subjective Impression*
	140		
Civil defense siren (100')			
	130		
Jet takeoff (200')	120		Pain threshold
	110	Rock music concert	
Pile driver (50')	100		Very loud
Ambulance siren (100')			
	90	Boiler room	
Freight cars (50')		Printing press plant	
Pneumatic drill (50')	80	In kitchen with garbage disposal running	
	70		Moderately loud
Vacuum cleaner (10')	60	Data processing center	
		Department store	
Light traffic (100')	50	Private business office	
Large transformer (200')			
	40		Quiet
Soft whisper (5')	30	Quiet bedroom	
	20	Recording studio	
	10		Threshold of hearing
	0		

Source: U.S. Department of Housing and Urban Development 1985.

Sound Exposure Level is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the Sound Exposure Level of an overflight is usually greater than the maximum sound level of the overflight.

Sound exposure level is a composite metric which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Because the sound exposure level and the maximum sound level are both A-weighted sound levels expressed in decibels, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

1.2.3 Day-Night Average Sound Level

Time-average sound levels are the measurements of sound levels which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (abbreviated DNL or L_{dn}) is used. Day-Night Average Sound Level averages aircraft sound levels at a location over a complete 24-hour period, with a 10-decibel adjustment added to those noise events which take place between 10:00 P.M. and 7:00 A.M. (local time) the following morning. This 10-decibel "penalty" represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

Ignoring the 10-decibel nighttime adjustment for the moment, Day-Night Average Sound Level may be thought of as the continuous A-weighted Sound Level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

Day-Night Average Sound Level provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels which occur during the day. For example, a Day-Night Average Sound Level of 65 dB could result from a very few noisy events, or a large number of quieter events.

As noted earlier for Sound Exposure Level, Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys which have been conducted to appraise community annoyance to all types of environmental noise have found the Day-Night Average Sound Level

to be the best measure of that annoyance. Its use is endorsed by the scientific community (ANSI 1980; ANSI 1988; USEPA 1972a; FICUN 1980; FICON 1992).

There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of Day-Night Average Sound Level. This is illustrated in Figure E-1, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in Day-Night Average Sound Level.

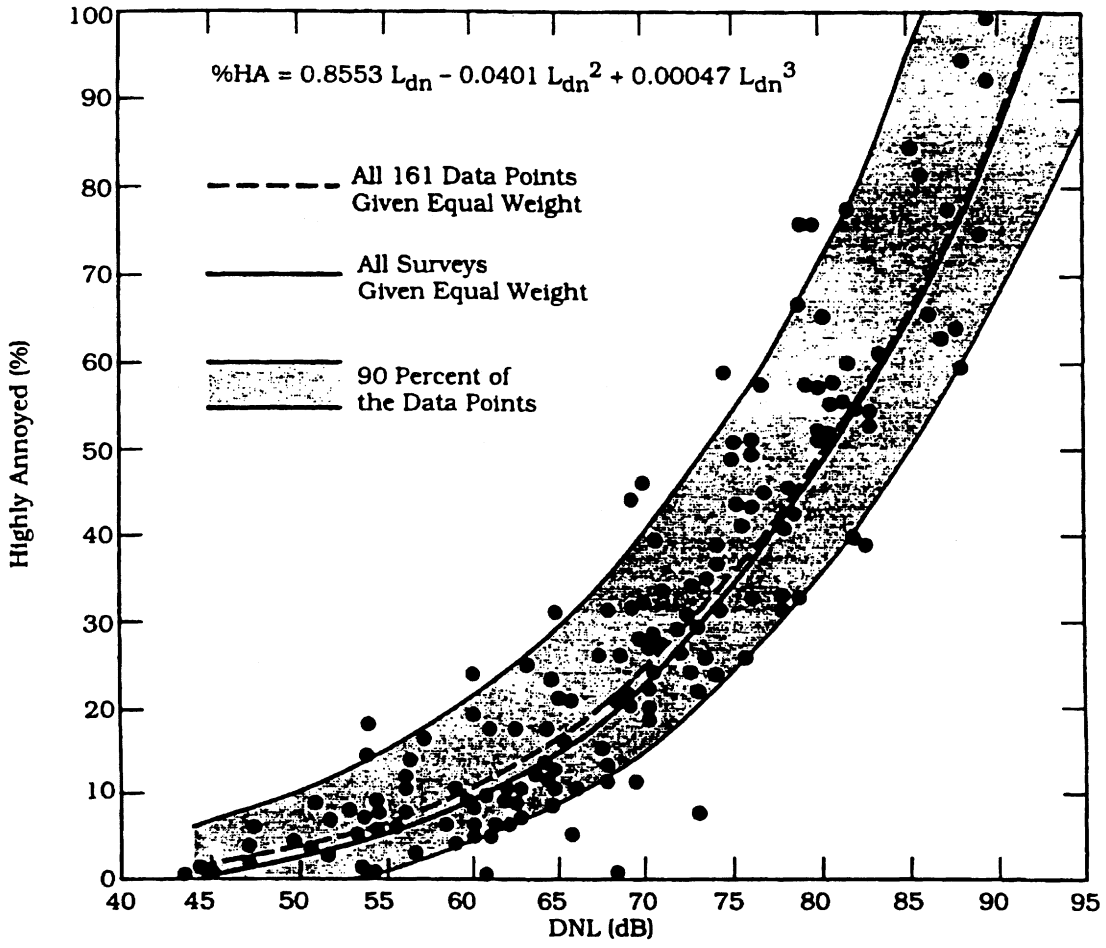
Figure E-1 was taken from a 1978 publication (Schultz 1978), and shows the original curve fit. A more recent study has reaffirmed this relationship (Fidell et al. 1991). Figure E-2 (FICON 1992) shows an updated form of the curve fit (Finegold et al. 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using Day-Night Average Sound Level.

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. A NASA study (Fields and Powell 1985) reported the reactions of individuals in a community to daily helicopter overflights, ranging from one to 32 per day. The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of Day-Night Average Sound Level has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of L_{dn}. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

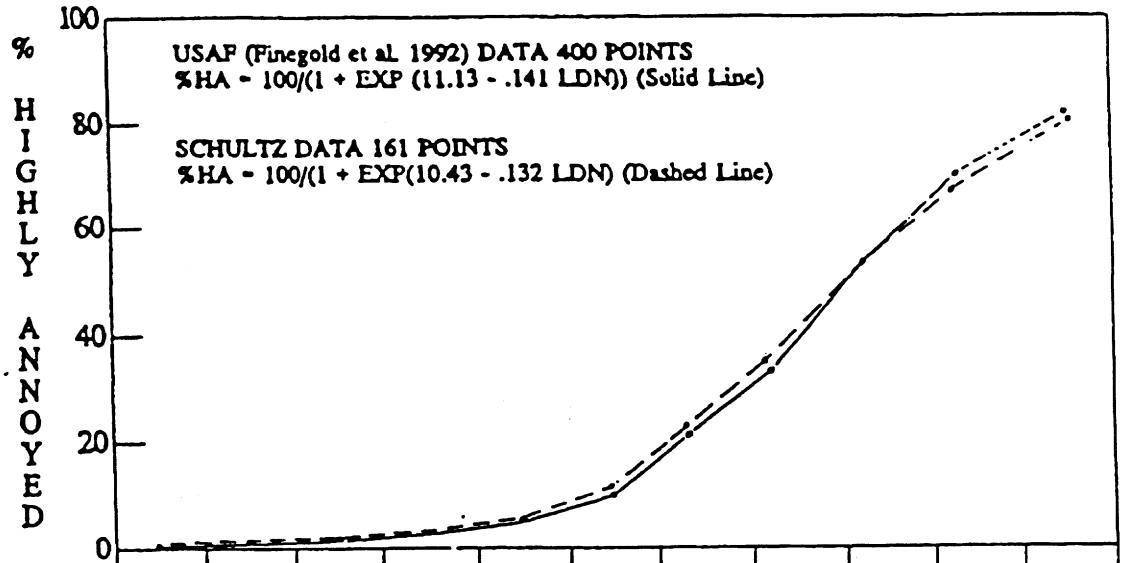
In fact, a time-average noise metric, such as L_{dn}, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The Day-Night Average Sound Level for this 24-hour period is 65.5 dB. Assume, as a second example, that ten such 30-second overflights occur in daytime hours during the next 24-



Source: Schultz, 1978.

Figure E-1. Community Surveys of Noise Annoyance



Day - Night Average Sound Level in dB	40	45	50	55	60	65	70	75	80	85	90
Calculated %HA Points: USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
Calculated %HA Points: SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Figure E-2. Response of Communities to Noise; Comparison of Original (Schultz 1978) and Current (Finegold *et al.* 1994) Curve Fits

hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The Day-Night Average Sound Level for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and specifically the Day-Night Average Sound Level.

1.2.4 Onset-Rate Adjusted Day-Night Average Sound Level

Aircraft operations along low-altitude Military Training Routes (MTRs) generate a noise environment somewhat different from other community noise environments. Overflights are highly sporadic, ranging from five or ten per day to less than five per week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events, because of the low-altitude and high-airspeed characteristics of military aircraft operating on Military Training Routes. To represent these differences, the conventional Day-Night Average Sound Level metric is adjusted to account for the "surprise" effect of the sudden onset of aircraft noise events on humans (Plotkin et al. 1991; Stusnick et al. 1992; Stusnick et al. 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 30 dB per second, an adjustment or penalty ranging from 0 to 5 dB is added to the normal Sound Exposure Level. Onset rates above 30 dB per second require a 5 dB penalty, while onset rates below 15 dB per second require no adjustment. The Day-Night Average Sound Level is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day Night Average Sound Level (abbreviated L_{dnr}). Because of the sporadic occurrences of aircraft overflights along Military Training Routes, the number of average daily operations is determined by using the calendar month with the highest number of operations along the Military Training Route. The monthly average is denoted L_{dnmr}.

1.3 LAND-USE COMPATIBILITY

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the Day-Night Average Sound Level or Onset-Rate Adjusted Day-Night Average Sound Level for military overflights.

In June 1980, an *ad hoc* Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating Day-Night Average Sound Levels to compatible land uses. This committee was composed of representatives from the U.S. Departments of Defense, Transportation, and Housing and Urban Development; the Environmental Protection Agency; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, the Department of Defense and the Federal Aviation Administration (FAA) adopted the concept of land-use compatibility as the accepted measure of

aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table E-2, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory, they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor Day-Night Average Sound Levels (L_{dn} values) above 65 dB, and the extent of land areas and populations exposed to L_{dn} of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

In 1990 a new Federal Interagency Committee on Noise was formed to review the manner in which aviation noise effects are assessed and presented. This group released its report in 1992 and reaffirmed the use of Day-Night Average Sound Level as the best metric for this purpose (FICON 1992).

Analyses of aircraft noise impacts and compatible land uses around Department of Defense facilities and airspaces are normally made using NOISEMAP (Moulton 1992) and/or ROUTEMAP (Lucas and Plotkin 1988). These computer-based simulation programs calculate Day-Night Average Sound Levels at many points on the ground around an airfield or military operating area and draw contours of equal level for overlay onto land-use maps of the same scale. Each program mathematically calculates the Sound Exposure Levels of all aircraft operations for a 24-hour period, taking into consideration the number and types of aircraft, their flight paths and engine thrust settings, the time of day (daytime or nighttime) that each operation occurs, and the onset rate, as appropriate. NOISEMAP and ROUTEMAP utilize the same physical models and aircraft performance data and are collectively referred to as "NOISEMAP technology" or simply "NOISEMAP."

Day-Night Average Sound Levels may also be measured directly around an airfield, rather than calculated with NOISEMAP; however, the direct measurement of annualized Day-Night Average Sound Level is difficult and costly since it requires year-round monitoring or careful seasonal sampling.

NOISEMAP provides an accurate projection of aircraft noise around airfields. NOISEMAP also has the flexibility of calculating sound levels at any specified ground location so that noise levels at representative points under flight paths can be ascertained. NOISEMAP is most accurate for comparing "before and after" noise impacts which would result from proposed airfield changes or alternative noise control actions, so long as the various impacts are calculated in a consistent manner.

2.0 NOISE EFFECTS

2.1 HEARING LOSS

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-

Table E-2
LAND-USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day-Night Average Sound Level (L_{dn}) in decibels					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoria, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE

SLUCM = Standard Land-Use Coding Manual.
Y (Yes) = Land Use and related structures compatible without restrictions.
N (No) = Land Use and related structures are not compatible and should be prohibited.
NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

NOTES:

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal level is low.
(5) Land-use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (USEPA 1972a). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a Day-Night Average Sound Level of 75 dB, and this level is extremely conservative.

2.2 NONAUDITORY HEALTH EFFECTS

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have never been found to occur at levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on 22–24 January 1990 in Washington, D.C., which states the following:

> "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day). At the recent (1988) International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (von Gierke 1990; parenthetical wording added for clarification.)

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two UCLA researchers apparently found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meecham and Shaw 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Fredricks et al. 1980).

As a second example, two other UCLA researchers used this same population near Los Angeles International Airport to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport (Jones and Tauscher 1978). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979).

A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands (CHCN 1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long-term health effects was a 16-hour (0600 to 2200) L_{eq} of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with L_{dn}, this corresponds to L_{dn} of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

2.3 ANNOYANCE

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (USEPA 1972a). As noted in the discussion of Day-Night Average Sound Level above, community annoyance is best measured by that metric.

Because the EPA Levels Document (USEPA 1972a) identified L_{dn} of 55 dB as "...requisite to protect public health and welfare with an adequate margin of safety", it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified L_{dn} of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (FICON 1992). This corresponds to about 13 percent of the exposed population being highly annoyed.

Although L_{dn} of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases. In this LEIS, no specific threshold is used. The noise in each affected area is evaluated on the basis of the information presented in this appendix and in the body of the LEIS. Particular attention is given to the ideal 55 dB identified by EPA.

2.4 SPEECH INTERFERENCE

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The

quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the Sound Exposure Level metric will measure speech interference successfully, and that a Sound Exposure Level exceeding 65 dB will begin to interfere with speech communication.

2.5 SLEEP INTERFERENCE

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

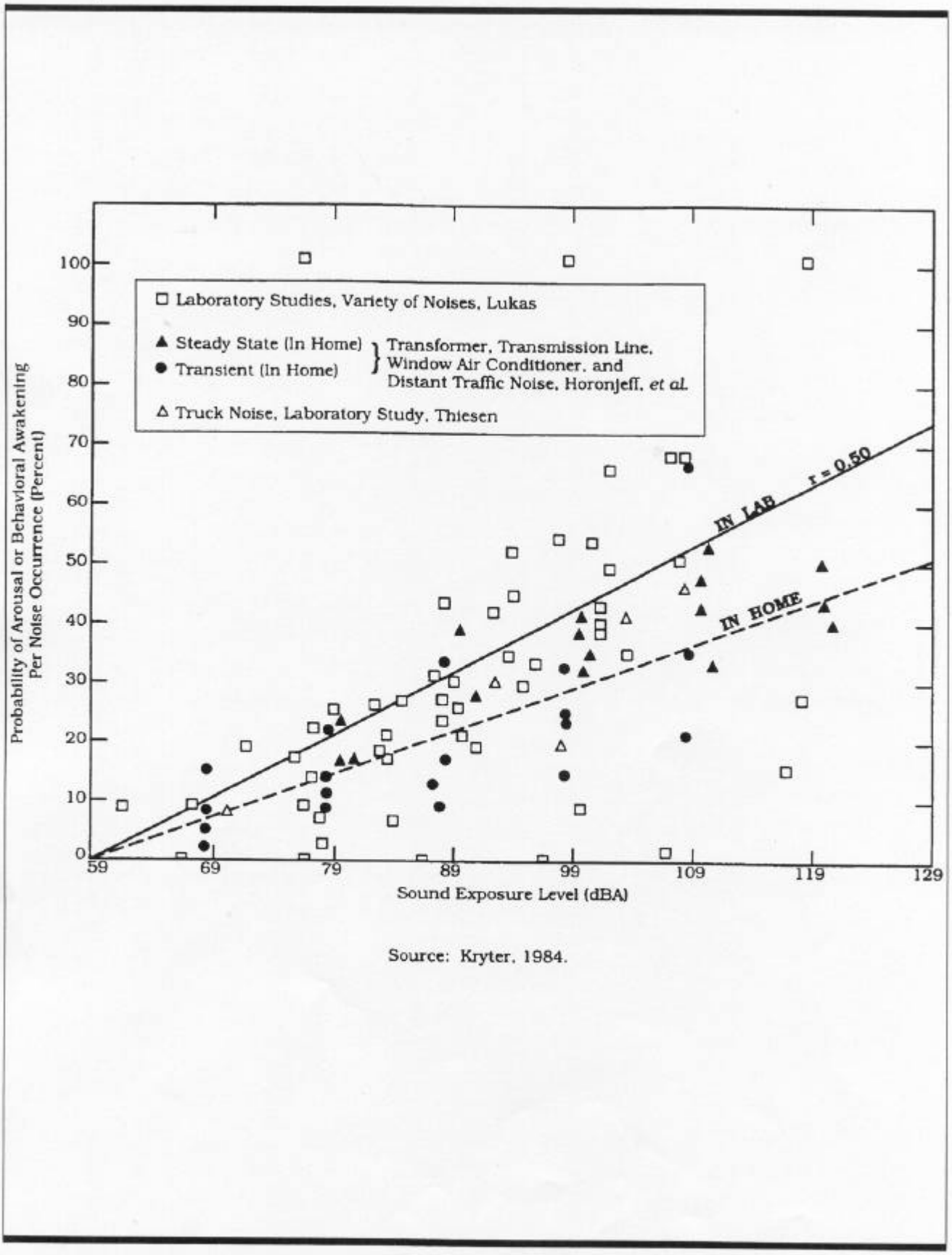
A recent analysis sponsored by the U.S. Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons et al. 1989). The analysis concluded that a lack of reliable studies in homes, combined with large differences among the results from the various laboratory studies and the limited in-home studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced in the home. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions.

Nevertheless, some guidance is available in judging sleep interference. The EPA identified an indoor Day-Night Average Sound Level of 45 dB as necessary to protect against sleep interference (USEPA 1972a). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor Day-Night Average Sound Level of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of Sound Exposure Level (Kryter 1984). Figure E-3, extracted from Figure 10.37 of Kryter 1984, indicates that an indoor Sound Exposure Level of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

2.6 NOISE EFFECTS ON DOMESTIC ANIMALS AND WILDLIFE

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and



Source: Kryter, 1984.

Figure E-3. Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level

attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

There are available many scientific studies regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight" due to noise. Few of these studies or reports include any reliable measures of the actual noise levels involved. However, in the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans (NRC NAS 1977).

2.7 NOISE EFFECTS ON STRUCTURES

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonances. While certain frequencies (such as 30 hertz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (NRC NAS 1977).

A recent study, directed specifically at low-altitude, high-speed aircraft on Military Training Routes, showed that there is little probability of structural damage from such operations (Sutherland 1989). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle," of objects within the dwelling − hanging pictures, dishes, plaques, and bric-a-brac. Window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally compatible with residential land use. Thus assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

2.8 NOISE EFFECTS ON TERRAIN

Members of the public often perceive that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

2.9 NOISE EFFECTS ON HISTORICAL AND ARCHAEOLOGICAL SITES

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport (IAD). These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Wesler 1977). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning within the building itself.

As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

3.0 IMPULSIVE NOISE ASSOCIATED WITH THE DETONATION OF HIGH EXPLOSIVES

Many targets on NAFR are capable of supporting the delivery of live ordnance. This section of this appendix discusses the methodology used to quantify the acoustic effects associated with the detonation of high explosives and develops capacity assessments for these targets that indicate the levels of ordnance use they can support without creating environmental acoustic impacts outside the boundaries of the range.

The noise associated with the detonation of high explosives is impulsive in nature, and its main components emphasize very low frequencies, often equal to or less than 100 cycles per second (Hertz [Hz]). Since the noise is impulsive, it is measured on the “C-weighted” scale.

The noise model used for this impact assessment is the Noise Assessment and Prediction System (NAPS) developed for the U.S. Army’s Atmospheric Sciences Laboratory, White Sands Missile Range, New Mexico. The NAPS model is a single-event model that generates sound intensity contours based on meteorological conditions that influence the speed of sound and the propagation of sound. NAPS calculates Sound Pressure Levels (SPL) in dBP (unweighted maximum sound pressure level, in decibels) based on the amount of explosive material normalized to an equivalent weight of trinitrotoluene (TNT). The model uses a ray trace approach that takes into account spherical spreading, atmospheric absorption, and refraction (Smith et al. 1991).

SPLs spread spherically in the absence of wind. This spreading is normally calculated so that for each doubling of distance from the noise source, the SPL decreases by 6 dB (U.S. Army 1995).

The atmosphere absorbs sound energy. However, this absorption is not a significant factor for sounds with frequencies of 500 Hz or less. For example, at 10 Hz, approximately 0.04 dB is lost to atmospheric absorption over a 10 kilometer (km) distance, and for a sound at 100 Hz, about 3.5 dB is attenuated over the same distance. Conversely, for a sound at 1,000 Hz, approximately 100 dB would be lost over the same 10 km. What is important is that when sound created by the detonation of high explosives is considered, since these sounds normally occur in the 5-10 Hz range or less, atmospheric absorption has little effect (U.S. Army 1995).

Ground impedance is a measurement of the extent to which an acoustic wave traveling through the atmosphere would be absorbed into the ground upon contact, or reflected back into the atmosphere. Soft sands, such as those found on beaches, and fresh, powdery snow, are examples of ground with low impedance, where most of the acoustic energy is absorbed, and little is reflected. Medium impedance surfaces reflect a majority of the acoustic energy, and most lands within the United States are classified as medium impedance surfaces for sounds of 200 Hz or less. Surfaces such as water, concrete, and mountains with rock outcroppings are illustrative of high impedance surfaces which will reflect all, or almost all of the acoustic energy (U.S. Army 1995).

As previously discussed, actual SPLs are usually "weighted" to more closely approximate the response of the human ear to the sound. The most commonly used metrics for characterizing impulsive noise are based on the "C-weighting" protocol, which represses SPLs under 100 and over 3,000 Hz. Field measurements suggest that unweighted SPLs are 22 to 25 dB higher than C-weighted SPLs for high explosive events (Kerry and Ford 1994).

The dBP metric utilized by the NAPS model does not reflect the cumulative effects from multiple noise events over time. The preferred metric for assessing the annoyance level associated with multiple impulsive noise events associated with use of high explosives is the C-weighted Day-Night Average Sound Level (L_{Cdn}). L_{Cdn} is calculated:

$$L_{Cdn} = CSEL + \left(10 Log_{10}\left(N_D + 10 N_N\right)\right) - 49.4$$

Equation 1

Where:

CSEL = C-weighted Sound Exposure Level for a single event.
N_D = Number of events per 24-hour period occurring between 7:00 A.M. and 10:00 P.M. (daytime)
N_N = Number of events per 24-hour period occurring between 10:01 P.M. and 6:59 A.M. (nighttime). Multiplying the events by 10 assigns a 10 dB penalty for noise events at night.
49.4 = 10 Log_{10} times 86,400 (the number of seconds in a 24-hour period).

Source: U.S Army CERL 1986

Further, the relationship between dBP and CSEL is given by the following:

$$CSEL \cong dBP - 25$$

Equation 2

Source: Kerry and Ford 1994

Therefore, a dBP-dependent equation for L_{Cdn} may be written as follows, and, based on substitution:

$$L_{Cdn} \cong dBP - 25 + \left(10Log_{10}\left(N_D + 10N_N\right)\right) - 49.4$$

Equation 3a

and

$$L_{Cdn} \cong dBP + \left(10Log_{10}\left(N_D + 10N_N\right)\right) - 74.4$$

Equation 3b

For land use planning purposes, L_{Cdn} 62 is generally considered to be equivalent to L_{dn} 65. That is, residential development is normally compatible with noise levels below L_{Cdn} 62.

Although the NAPS model outputs contours in unweighted SPL, this output can be used to represent L_{Cdn} values. As shown above, if one noise event occurred during daytime in a 24-hour period, then the L_{Cdn} value would be 74.4 dB lower than the NAPS calculated SPL (Equations 3a and 3b). Therefore:

$$L_{Cdn}\,62 = 136.4dBP$$

Equation 4

As the number of events from the same source increase above one per 24-hour period, the value of:

$$10Log_{10}\left(N_D + 10N_N\right)$$

may be subtracted from 136.4 to obtain the SPL contour value from NAPS that is equivalent to L_{Cdn} 62. For multiple sources contributing different sound levels at given distances, source specific L_{Cdn} values would be summed logarithmically to obtain total cumulative L_{Cdn}.

Alternatively, if it is desired to keep exposure of a given location at or below a specific L_{Cdn} value, and the unweighted SPL value is known for that location, the number of permissible day-equivalent events that can occur may be calculated by:

$$AntiLog_{10}\left(\frac{136.4 - SPL}{10}\right) = N_{DE}$$

Equation 5

As indicated, Equation 5 provides the number of day-equivalent events. Dividing the result by ten would provide the number of night-permissible events. Mixed day and night events may be determined using a ratio of one night event to ten day events. For example, 30 day events would equal three night events, or ten day events and two night events.

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Appendix F
WATER ANALYSIS

Table F-1. Dry Lake Bed Drainage Areas and Runoff Volume Estimates Nellis Air Force Range Complex

Dry Lake Bed Watershed Designation/Name	*Watershed Area (square miles)*	*USGS Quadrangles* [1] *(1:100,000 scale)*	*Estimated Runoff Volume (acre-feet)*	*USGS Quadrangles* [2] *(1:24,000 scale)*
A — Ralston Valley	971	Cactus Flat Goldfield	49,715	Mud Lake North Mud Lake South
B — Cactus Flat (Total)	390	Cactus Flat	19,954	
Antelope Lake	254	Cactus Flat	13,005	Stinking Spring, SW
Northern Lake	136	Cactus Flat	6,949	Stinking Spring, NW
E — Stonewall Flat	346	Cactus Flat Goldfield	17,715	Stonewall Spring Packrat Canyon
F — Gold Flat	686	Cactus Flat Pahute Mesa	35,123	West of Quartzite Mt. Gold Flat East
G — Kawich Valley	359	Cactus Flat Pahute Mesa	18,381	Lamb's Pond Sundown Reservoir
L — Emigrant Valley	713	Cactus Flat Pahute Mesa Pahranagat Range Timpahute Range	36,506	Groom Mine Papoose Range
Q — Papoose Lake Valley	99	Pahranagat Range Indian Springs	5,069	Papoose Range Papoose Lake
S — Frenchman Flat	463	Restricted Access Area	23,706	Frenchman Lake
T — Indian Springs Valley	655	Outside of NAFR	33,536	Quartz Peak SW Tim Spring Indian Springs NW Heavens Well
U — Three Lakes Valley North	303	Indian Springs North Pahranagat Range North	15,514	Dog Bone Lake North Dog Bone Lake South
V — Three Lakes Valley South	345	Indian Springs Las Vegas	17,638	Black Hills NW Black Hills SW Indian Springs SE Heavens Well

Notes: 1. Dry lake bed watershed boundary shown on these U.S. Geological Survey (USGS) quadrangles.
2. Dry lake bed floodplain delineation shown on these quadrangles.

Source: Air Force 1997. Final Floodplain Inventory Report, Nellis Air Force Range, Nevada.

Table F-2. Valley Collector Drainage Areas and Peak Discharge Estimates
Nellis Air Force Range Complex (page 1 of 3)

Collector Watershed Designation	*Drainage Area (square miles)*	*USGS Quadrangles* [1] *(1:100,000 scale)*	*Estimated Peak Discharge (cfs)*	*USGS Quadrangles* [2] *(1:24,000 scale)*
A — Ralston Valley				
A-1	108	Cactus Flat	2,750	Mud Lake North
C — Cactus Flat				
C-1	60	Cactus Flat	1,760	Stinking Spring SW
C-2	30	Cactus Flat	1,130	Roller Coaster Knob Mellan Breen Creek
C-3	52	Cactus Flat	1,390	Roller Coaster Knob Mellan
C-4	60	Cactus Flat	1,700	Roller Coaster Knob Trappman Hills
E — Stonewall Flat				
E-1 / E-2	205	Cactus Flat	5,050	White Patch Drain Packrat Canyon
E-3	34	Goldfield	1,280	East of Goldfield
E-4	30	Goldfield	1,180	Stonewall Spring
E-5	35	Cactus Flat	1,300	Packrat Canyon
F — Gold Flat				
F-1	29	Pahute Mesa	1,200	West of Quartzite Mt.
F-2	21	Pahute Mesa	1,000	Gold Flat East
F-3	347	Cactus Flat Pahute Mesa	7,370	Gold Flat East
F-4	26	Pahute Mesa	1,120	Gold Flat East
F-8	38	Cactus Flat	1,350	West of Quartzite Mt.
F-9	178	Cactus Flat	3,900	West of Quartzite Mt.
G — Kawich Valley				
G-1	118	Cactus Flat	3,296	Lamb's Pond
G-2	32	Pahute Mesa	1,220	Lamb's Pond
K — Sarcobatus Flat				
K-1	139	Last Chance Range	3,100	Scotty's Junction

Table F-2. Valley Collector Drainage Areas and Peak Discharge Estimates
Nellis Air Force Range Complex (page 2 of 3)

Collector Watershed Designation	*Drainage Area (square miles)*	*USGS Quadrangles* [1] *(1:100,000 scale)*	*Estimated Peak Discharge (cfs)*	*USGS Quadrangles* [2] *(1:24,000 scale)*
K-2	85	Pahute Mesa	2,250	Springdale NW Tolicha Peak SW Tolicha Peak
L — Emigrant Valley L-1	75	Pahranagat Range	2,060	Groom Mine Groom Mine SW Papoose Range Fallout Hills NW
L-3/L-4	43	Pahranagat Range	1,500	Groom Mine
L-5	38	Pahranagat Range	1,350	Groom Mine
L-6	87	Pahranagat Range	2,300	Groom Mine Groom Mine SW
L-7	4.4	Pahranagat Range	700	Groom Mine
L-8	38	Pahranagat Range	1,350	Groom Mine
L-9	49	Pahranagat Range	1,600	Papoose Range
N — Oasis Valley N-1	207	Pahute Mesa	4,600	Thirsty Canyon SW Thirsty Canyon NW Thirsty Canyon
Q — Papoose Lake Valley Q-1	6	Pahranagat Range	750	Papoose Range
Q-2	31	Pahranagat Range	1,220	Papoose Lake
Q-3	39.6	Pahranagat Range	1,400	Papoose Lake
S — Frenchman Flat S-2	63	Indian Springs	1,940	Frenchman Lake
S-4	50	Indian Springs	1,600	Frenchman Lake
T — Indian Springs Valley T-1	59	Indian Springs	1,750	Indian Springs NW
T-2	202	Pahranagat Range Indian Springs	4,450	Quartz Peak SW Tim Spring

Table F-2. Valley Collector Drainage Areas and Peak Discharge Estimates
Nellis Air Force Range Complex (page 3 of 3)

Collector Watershed Designation	*Drainage Area (square miles)*	*USGS Quadrangles* [1] *(1:100,000 scale)*	*Estimated Peak Discharge (cfs)*	*USGS Quadrangles* [2] *(1:24,000 scale)*
T-3	5	Indian Springs	700	Indian Springs NW Heavens Well
U — Three Lakes Valley North U-1	22	Indian Springs Pahranagat Range	1,025	Dog Bone Lake North
U-2	53	Pahranagat Range Indian Springs	1,625	Dog Bone Lake North
U-3	32	Indian Springs	1,225	Dog Bone Lake North
V — Three Lakes Valley South V-1	66	Indian Springs	1,900	Black Hills NW Heavens Well

Notes: 1. Collector watershed boundary shown on these quadrangles.
2. Collector floodplain delineation shown on these quadrangles.

Source: Air Force 1997h. Final Floodplain Inventory Report, Nellis Air Force Range, Nevada.

Table F-3. Alluvial Fan Drainage Areas and Runoff Volume Estimates
Nellis Air Force Range Complex (page 1 of 2)

Dry Lake Bed Watershed Designation/Name	*Alluvial Fan Designation/Name*	*Alluvial Fan Drainage Area (square miles)*	*Estimated Peak Discharge (cfs)*	*USGS Quadrangles (1:24,000 scale) (Apex Quad First)*
E — Stonewall Flat	E-F1	1.12	359	Stonewall Spring
	E-F2	0.78	284	Stonewall Spring
	E-F3 Pack Rat Canyon	19.1	2,742	Pack Rat Canyon Stonewall Spring Scotty's Junction NE Tolicha Peak NW
	E-F4 Civet Cat Canyon	60.4	6,533	Pack Rat Canyon Civet Cat Cave Trappman Hills Tolicha Peak NE Mount Helen
F — Gold Flat	F-F1 Cedar Pass North	0.6	313	Wild Horse Ranch Cedar Pass Georges Water
	F-F2 Wild Horse Draw	10.9	2,022	Wild Horse Ranch Cedar Pass
	F-F3	1.48	490	Quartzite Mountain
	F-F4	3.1	848	Quartzite Mountain
	F-F5 Apache Tear Canyon	4.1	1,040	Apache Tear Canyon Gold Flat East
G — Kawich Valley	G-F1	4.8	1,363	Lambs Pond Belted Peak
	G-F2	5.1	1,271	Lambs Pond Belted Peak
	G-F3 Saucer Mesa	13.9	3,022	Apache Tear Canyon Dead Horse Flat
	G-F4	1.3	646	Sundown Reservoir Wheel Barrow Peak
L — Emigrant Valley	L-F1	23.3	2,871	Groom Mine NW Wheel Barrow Peak Belted Peak
	L-F5	42.4	5,895	Oak Spring Butte Quartet Dome Wheelbarrow Peak Sundown Reservoir
M — Tikapoo Valley	M-F1	15.9	2,539	Groom Range Groom Range NE
S — Frenchman Flat	S-F1	1.4	614	Frenchman Lake

Table F-3. Alluvial Fan Drainage Areas and Runoff Volume Estimates
Nellis Air Force Range Complex (page 2 of 2)

Dry Lake Bed Watershed Designation/Name	*Alluvial Fan Designation/Name*	*Alluvial Fan Drainage Area (square miles)*	*Estimated Peak Discharge (cfs)*	*USGS Quadrangles (1:24,000 scale) (Apex Quad First)*
				Frenchman Lake SE Mercury Mercury NE
T — Indian Springs Valley	T-F1	8.8	2,426	Quartz Peak SW
	T-F2	10.6	2,776	Quartz Peak SW
	T-F3	3.9	1,099	Tim Spring Heavens Well
	T-F4	4.9	1,272	Heavens Well
	T-F5	16.7	3,079	Quartz Peak Southeastern Mine
U — Three Lakes Valley North	U-F1 Indian Canyon	4.5	1,601	Quartz Peak
	U-F2	9.7	2,296	Dead Horse Ridge
	U-F3	6.7	1,574	Dog Bone Lake South Dead Horse Ridge Burro Basin
	U-F5 Joe May Canyon	9.0	1,606	Black Hills
V — Three Lakes Valley South	V-F2	1.15	481	Burro Basin
	V-F3	0.68	344	Mule Deer Ridge NW
	V-F4 Yellow Jacket Canyon	6.2	1,056	White Sage Flat Hayford Peak Dead Horse Ridge
	Spot Canyon	1.6	530	Black Hills SW

Source: Air Force 1997h. Final Floodplain Inventory Report, Nellis Air Force Range, Nevada.

Title: NV / Chapter 445A + Water Pollution Control + Standards for Water Quality + 445A.119
Section: 445A.119 Criteria for Water Quality for Designated Beneficial Uses
Date: September 25, 1990
Subject Terms: water | water quality | standard

Standards for Water Quality.

445A.119. Criteria for Water Quality for Designated Beneficial Uses.

The water quality criteria for designated beneficial uses for the various waters of the state are in the following table. The criteria are water quality characteristics based upon available scientific and technical information and are to be used as guidelines in establishing water quality standards.

ENFLEX Note: The following table is wider than your screen. Please scroll right to see the entire table.

Water Quality Criteria for Designated Beneficial Uses.(2)

Beneficial Uses / Parameter		Agricultural Uses: Irrigation	Agricultural Uses: Watering of Livestock	Aquatic Life: Cold Water: Propagation	Aquatic Life: Cold Water: Put & Take	Aquatic Life: Warm Water: Propagation	Aquatic Life: Warm Water: Put & Take	Water Contact Recreation	Non-Contact Recreation	Municipal or Domestic Supply	Industrial Supply	Propagation of Wildlife
Temperature ¦C		x	x	<---------- Site Specific Determination(a,b) ---------->				15 - 34(a)	x	x	x	x
pH Units Single Value		4.5 - 9.0(a,b)	5.0 - 9.0(b)	6.5 - 9.0(b)	6.5 - 9.0(b)	6.5 - 9.0(b)	6.5 - 9.0(b)	6.5 - 8.3(a)	x	5.0 - 9.0	3.0 - 11.7(b)	7.0 - 9.2(a)
Dissolved Oxygen Single Value-mg/l	>	x	Aerobic(b)	5.0(b)	5.0(b)	5.0(b)	5.0(b)	Aerobic(b)	Aerobic(b)	Aerobic(b)	x	Aerobic(b)
Chlorides Single Value-mg/l	<	y(a)	1500(f)	x	x	x	x	x	x	250/400(c)	--	1500(f)
Total Phosphates as P Single Value-mg/l		x	x	<---------- Site Specific Determination(b,e) ---------->							x	x
Nitrates as N Single Value-mg/l	<	x	100(a)	y(b)	x	90(b)	90(b)	x	x	10(b,c)	x	100(a)
Nitrites as N Single Value-mg/l	<	x	10(a)	0.06(b)	x	x	x	x	x	1.0(a,b)	x	10(a)
Total Nitrogen as N Single Value-mg/l		x	x	<---------- Site Specific Determination(b,e) ---------->							x	x
Un-ionized Ammonia as NH(3) Single Value-mg/l	<	x	x	0.02(b,e)	<------ Site Specific Determination ----->			x	x	0.5	x	x
Total Dissolved Solids Single Value-mg/l	<	x	3000(a)	x	x	x	x	x	x	500/1000(c)	x	x
Color (PT-CO) Single Value	<	x	x	x	x	x	x	x	x	75(b)	x	x
Turbidity, Single Value-NTU	<	x	x	10(d)	10(d)	50(d)	50(d)	x	x	y(b)	x	x
Fecal Coliform (MF/100ml) Geometric Mean	<	1000(a)	1000(a)	x	x	x	x	240/400(b) See Footnote (1)	1000/2000(d)	2000(a)	x	1000(a)
Alkalinity as C(a)CO(3) Single Value-mg/l		x	x	Less than 25% change from natural conditions(a,e)				x	x	x	x	30 - 130(a)
Suspended Solids Single Value-mg/l	<	x	x	25 - 80(a)	25 - 80(a)	25 - 80(a)	25 - 80(a)	x	x	x	x	x
Sulfates Single Value-mg/l	<	x	x	x	x	x	x	x	x	250(b,c)/500(c)	x	x

< means less than.
> means greater than.
x means a specific recommendation has not been developed.
y means the cited reference recommended no value be established.

(1) Based on a minimum of five samples taken over a 30-day period, the fecal coliform bacterial level must not exceed a log mean of 200 per 100 ml nor may more than 10 percent of the total samples taken during any 30-day period exceed 400 per 100 ml.

(2) The table is not all-inclusive. As the need arises and data becomes available, appropriate revisions and additions will be made.

(a) National Academy of Sciences, Water Quality Criteria (Blue Book) (1972).

(b) U.S. Environmental Protection Agency, Pub. No. EPA 440/9-76-023, Quality Criteria for Water (1976). Office of Water and Hazardous Materials, Washington, D.C.

(c) Nevada Division of Health, Water Supply Regulation, Part I, Water Quality Standards, Monitoring, Record Keeping and Reporting (1977). State Board of Health, Carson City, Nevada.

(d) Report of the Commission on Water Quality Criteria (FWPCA) (Green Book) (1968).

(e) American Fisheries Society, Water Quality Section, A Review of the EPA Red Book; Quality Criteria for Water (1979).

(f) McKee and Wolf, California State Water Resources Control Board, Water Quality Criteria (1963).

[Environmental Comm'n, Water Pollution Control Reg. ° 4.1.4, eff. 9-15-80]
(NAC A 7-27-82; 12-3-84; 9-25-90)
(Substituted in revision for NAC 445.117)

Title: NV / Chapter 445A · Water Pollution Control · Standards for Water Quality · 445A.120
Section: 445A.120 Applicability
Date: December 3, 1984
Subject Terms: water | surface water | water quality | applicability

445A.120. Applicability.

1. NAC 445A.120 to 445A.213, inclusive, apply to all natural streams and lakes, reservoirs or impoundments on natural streams and other specified waterways, unless excepted on the basis of existing irreparable conditions which preclude such use. Man-made waterways, unless otherwise specified, must be protected for public health and the use for which the waterways were developed.

2. The quality of any waters receiving waste discharges must be such that no impairment of the beneficial usage of water occurs as the result of the discharge. Natural water conditions may, on occasion, be outside the limits established by standards. The standards adopted in NAC 445A.120 to 445A.213, inclusive, relate to the condition of waters as affected by discharges relating to the activities of man.

[Environmental Comm'n, Water Pollution Control Reg. § 4.1, eff. 5-2-78]
(NAC A 12-3-84)
(Substituted in revision for NAC 445.118)

Title: NV / Chapter 445A · Water Pollution Control · Standards for Water Quality · 445A.121
Section: 445A.121 Standards Applicable to All Waters
Date: September 26, 1990
Subject Terms: water | water quality | standard | compliance

445A.121. Standards Applicable to All Waters.

The following standards are applicable to all waters of the state:

1. Waters must be free from substances attributable to domestic or industrial waste or other controllable sources that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous or in amounts sufficient to interfere with any beneficial use of the water.

2. Waters must be free from floating debris, oil, grease, scum and other floating materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to be unsightly or in amounts sufficient to interfere with any beneficial use of the water.

3. Waters must be free from materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance or in amounts sufficient to interfere with any beneficial use of the water.

4. Waters must be free from high temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances attributable to domestic or industrial waste or other controllable sources at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life or in amounts sufficient to interfere with any beneficial use of the water. Compliance with the provisions of this subsection may be determined in accordance with methods of testing prescribed by the department. If used as an indicator, survival of test organisms must not be significantly less in test water than in control water.

5. If toxic materials are known or suspected by the department to be present in a water, testing for toxicity may be required to determine compliance with the provisions of this section and effluent limitations. The department may specify the method of testing to be used. The failure to determine the presence of toxic materials by testing does not preclude a determination by the department, on the basis of other criteria or methods, that excessive levels of toxic materials are present.

6. Radioactive materials attributable to municipal, industrial or other controllable sources must be the minimum concentrations which are physically and economically feasible to achieve. In no case must materials exceed the limits established in the 1962 Public Health Service Drinking Water Standards (or later amendments) or 1/30th of the MPC values given for continuous occupational exposure in the "National Bureau of Standards Handbook No. 69." The concentrations in water must not result in accumulation of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life.

7. Wastes from municipal, industrial or other controllable sources containing arsenic, barium, boron, cadmium, chromium, cyanide, fluoride, lead, selenium, silver, copper and zinc that are reasonably amenable to treatment or control must not be discharged untreated or uncontrolled into the waters of Nevada. In addition, the limits for concentrations of the chemical constituents must provide water quality consistent with the mandatory requirements of the 1962 Public Health Service Drinking Water Standards.

8. The specified standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of extreme high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

[Environmental Comm'n, Water Pollution Control Reg. § 4.1.2 subsecs. a - g, eff. 5-2-78]
(NAC A 9-26-90)
(Substituted in revision for NAC 445.119)

Title: NV / Chapter 445A · Water Pollution Control · Standards for Water Quality · 445A.122
Section: 445A.122 Standards Applicable to Beneficial Uses
Date: November 9, 1995
Subject Terms: water | water quality | standard | agriculture

445A.122. Standards Applicable to Beneficial Uses.

1. The following standards are intended to protect both existing and designated beneficial uses and must not be used to prohibit the use of the water as authorized under Title 48 of NRS:

(a) Watering of livestock. The water must be suitable for the watering of livestock without treatment.

(b) Irrigation. The water must be suitable for irrigation without treatment.

(c) Aquatic life. The water must be suitable as a habitat for fish and other aquatic life existing in a body of water. This does not preclude the reestablishment of other fish or aquatic life.

(d) Recreation involving contact with the water. There must be no evidence of manmade pollution, floating debris, sludge accumulation or similar pollutants.

(e) Recreation not involving contact with the water. The water must be free from:

(1) Visible floating, suspended or settled solids arising from man's activities;
(2) Sludge banks;

(3) Slime infestation;

(4) Heavy growth of attached plants, blooms or high concentrations of plankton, discoloration or excessive acidity or alkalinity that leads to corrosion of boats and docks;

(5) Surfactants that foam when the water is agitated or aerated; and

(6) Excessive water temperatures.

(f) Municipal or domestic supply. The water must be capable of being treated by conventional methods of water treatment in order to comply with Nevada's drinking water standards.

(g) Industrial supply. The water must be treatable to provide a quality of water which is suitable for the intended use.

(h) Propagation of wildlife. The water must be suitable for the propagation of wildlife and waterfowl without treatment.

(i) Waters of extraordinary ecological o r aesthetic value. The unique ecological or aesthetic value of the water must be maintained.

(j) Enhancement of water quality. The water must support natural enhancement or improvement of water quality in any water which is downstream.

2. This section does not entitle an appropriator to require that the source meet his particular requirements for water quality.

[Environmental Comm'n, Water Pollution Control Reg. § 4.1.1, eff. 5-2-78]
(NAC A 11-22-82; 12-3-84; 11-9-95)

Title: NV / Chapter 445A · Water Pollution Control · Standards for Water Quality · 445A.123
Section: 445A.123 Classification and Reclassification of Waters
Date: December 3, 1984
Subject Terms: water | surface water | water quality | water classification

445A.123. Classification and Reclassification of Waters.

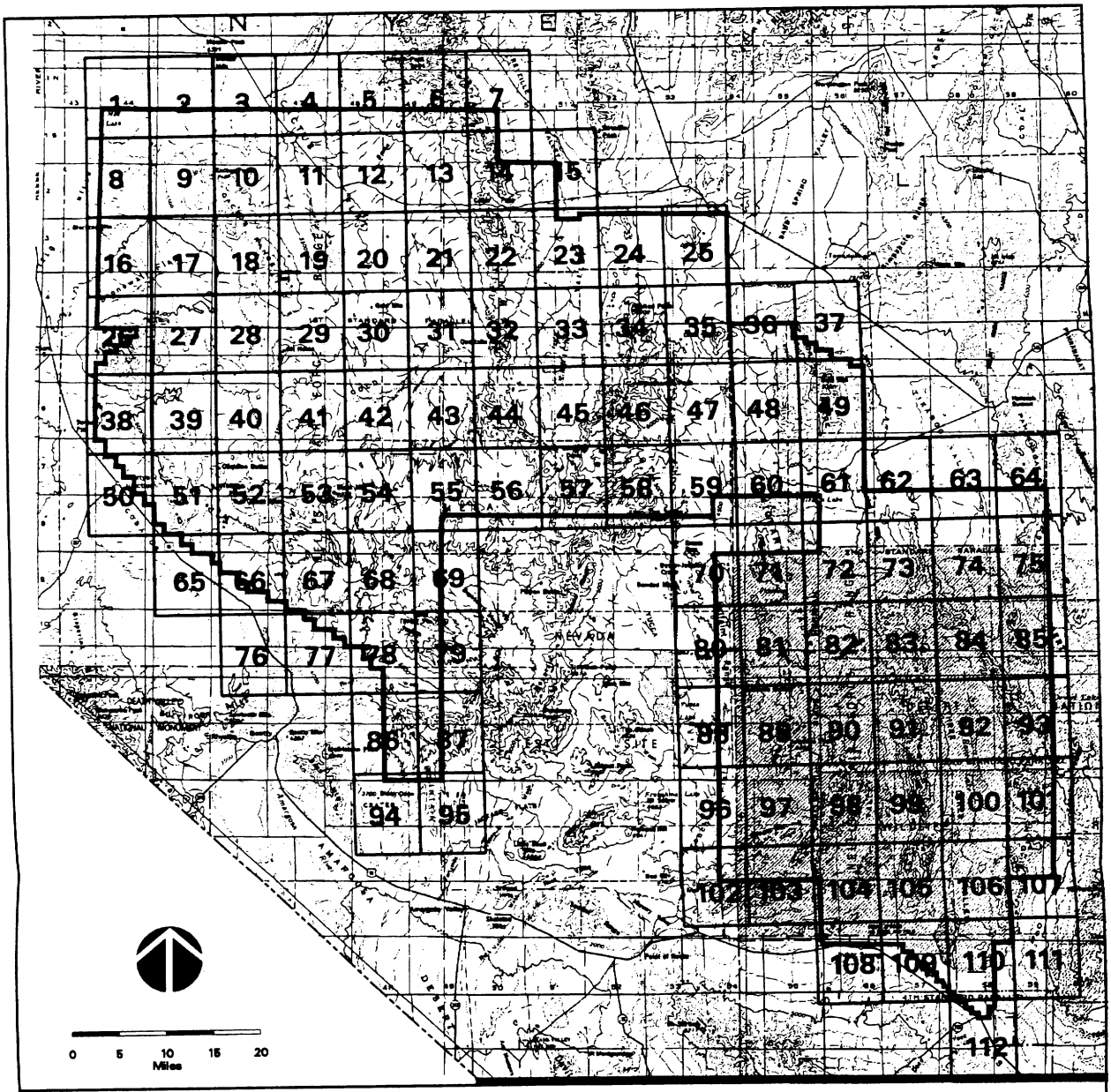
1. Stream standards and classifications in NAC 445A.123 to 445A.127, inclusive, do not preclude the commission from establishing standards and classifications for additional public waters nor reclassifying the waters covered by those sections.

2. The commission will consider classification of a body of public water not contained in the tables in NAC 445A.123 to 445A.127, inclusive, upon a request for a permit to discharge into that body of water.

[Environmental Comm'n, Water Pollution Control Reg. § 4.2, eff. 5-2-78]
(NAC A 12-3-84)
(Substituted in revision for NAC 445.121)

Appendix G
BIOLOGICAL RESOURCES DATA

Appendix G-1
Site Locations for Rare Plants on Nellis Air Force Range (TNC 1997)



Threatened & Endangered Plant Survey
Nellis AFB Bombing & Gunnery Range

7.5 min. QUAD INDEX

1 Mud Lake North
2 Monitor Peak
3 Reads Ranch
4 Stinking Spring NW
5 Stinking Spring
6 Kawich Peak
7 Kawich Peak NE
8 Mud Lake South
9 Cactus Peak
10 East of Cactus Peak
11 Stinking Spring SW
12 Breen Creek
13 Kawich Peak SW
14 Georges Water
15 Reveille Peak
16 East of Goldfield
17 White Patch Draw
18 Cactus Spring
19 Roller Coaster Knob
20 Mellen
21 Wild Horse Ranch
22 Cedar Pass
23 Rhyolite Knob
24 Monotony Valley
25 White Blotch Springs NW
26 Stonewall Spring
27 Pack Rat Canyon
28 Civet Cat Cave
29 Trappman Hills
30 Triangle Mountain
31 West of Quartzite Mountain
32 Quartzite Mountain
33 Lambe Pond
34 Belted Peak
35 White Blotch Springs
36 White Blotch Springs SE
37 Tempiute Mountain South
38 Scottys Junction NE
39 Tolicha Peak NW
40 Tolicha Peak NE
41 Mount Helen
42 Gold Flat West
43 Gold Flat East
44 Apache Tear Canyon
45 Sundown Reservoir
46 Wheelbarrow Peak
47 Groom Mine NW
48 Cattle Spring
49 Groom Range
50 Scottys Junction
51 Tolicha Peak SW
52 Tolicha Peak
53 Black Mountain
54 Trail Ridge
55 Silent Butte
56 Dead Horse Flat
57 Quartet Dome
58 Oak Spring Butte
59 Groom Mine SW
60 Groom Mine
61 Groom Range SW
62 Groom Range SE
63 Cutler Reservoir
64 Badger Spring
65 Springdale NW
66 Springdale NE
67 Thirsty Canyon NW
68 Thirsty Canyon
69 Scrugham Peak
70 Jangle Ridge
71 Papoose Range
72 Fallout Hills NW
73 Fallout Hills NE
74 Desert Hills NW
75 Desert Hills NE
76 Springdale
77 Thirsty Canyon SW
78 Thirsty Canyon SE
79 Timber Mountain
80 Paiute Ridge
81 Papoose Lake
82 Fallout Hills
83 Southeastern Mine
84 Desert Hills SW
85 Desert Hills SE
86 East of Beatty Mountain
87 Topopah Spring NW
88 Plutonium Valley
89 Aysees Peak
90 Quartz Peak NW
91 Quartz Peak
92 Dog Bone Lake North
93 Burro Basin
94 Crater Flat
95 Busted Butte
96 Frenchman Lake
97 Frenchman Lake SE
98 Quartz Peak SW
99 Tim Spring
100 Dog Bone Lake South
101 Dead Horse Ridge
102 Mercury
103 Mercury NE
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105 Heavens Well
106 Black Hills NW
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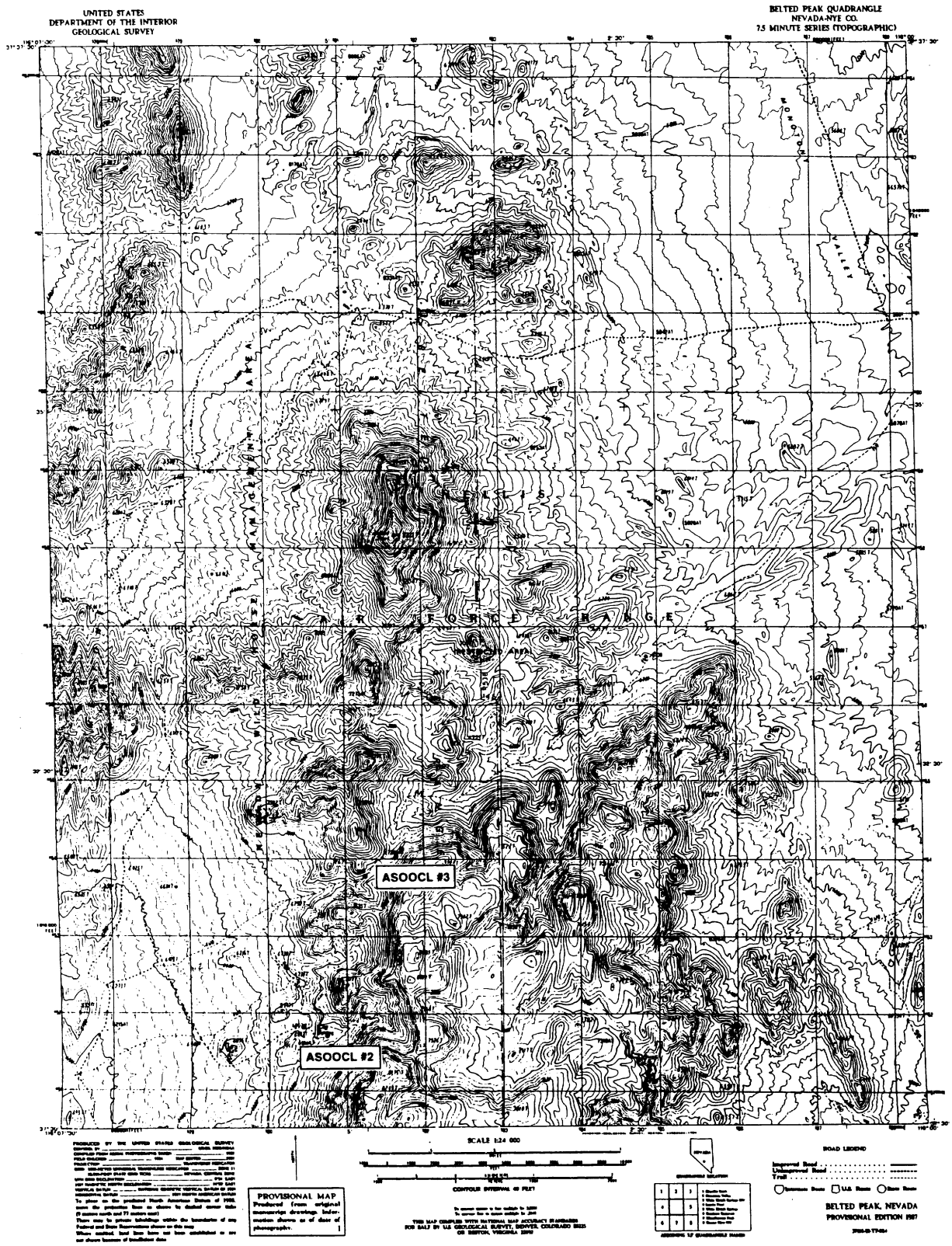
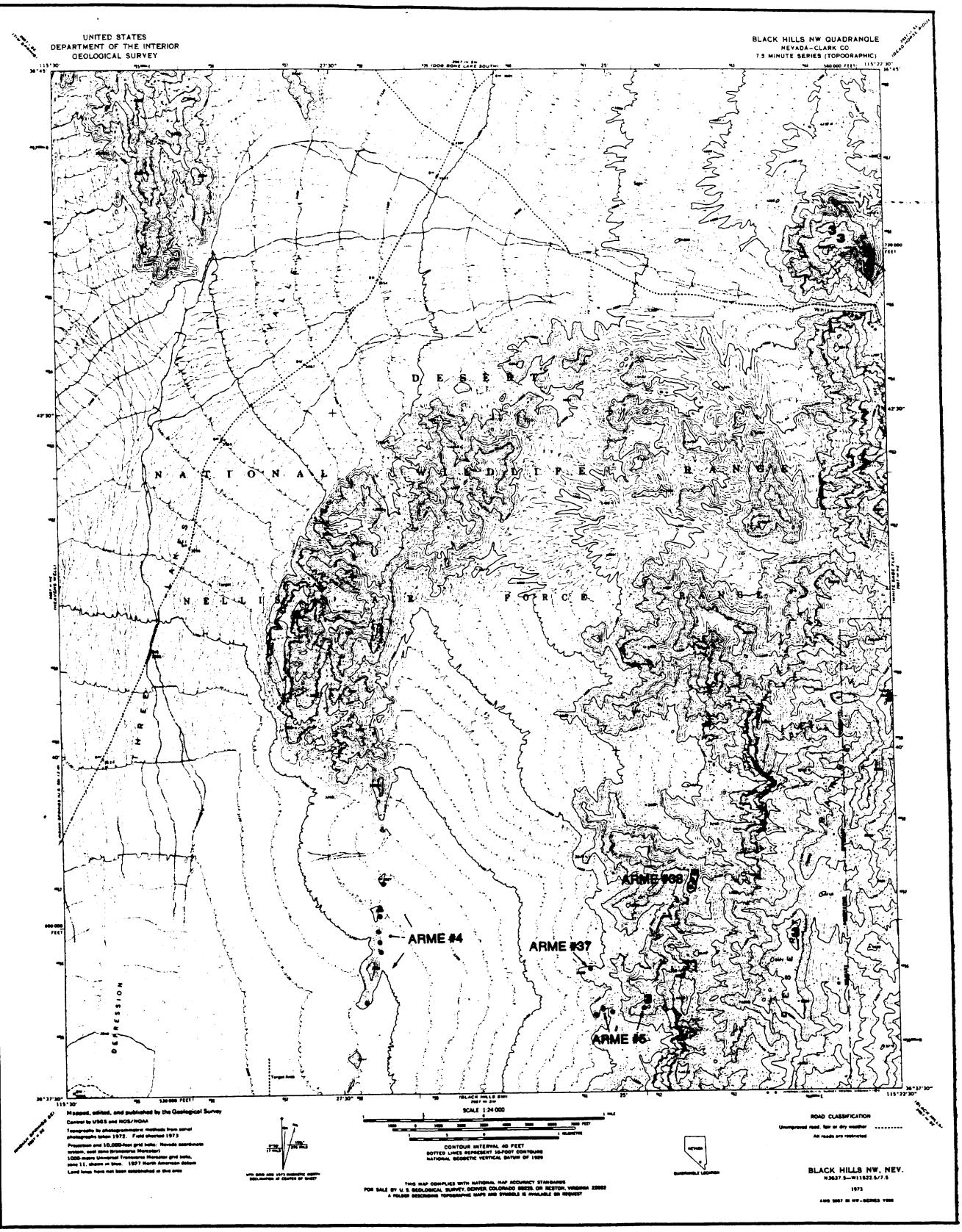
108 Indian Springs
109 Indian Springs SE
110 Black Hills SW
111 Black Hills
112 Corn Creek Springs NW



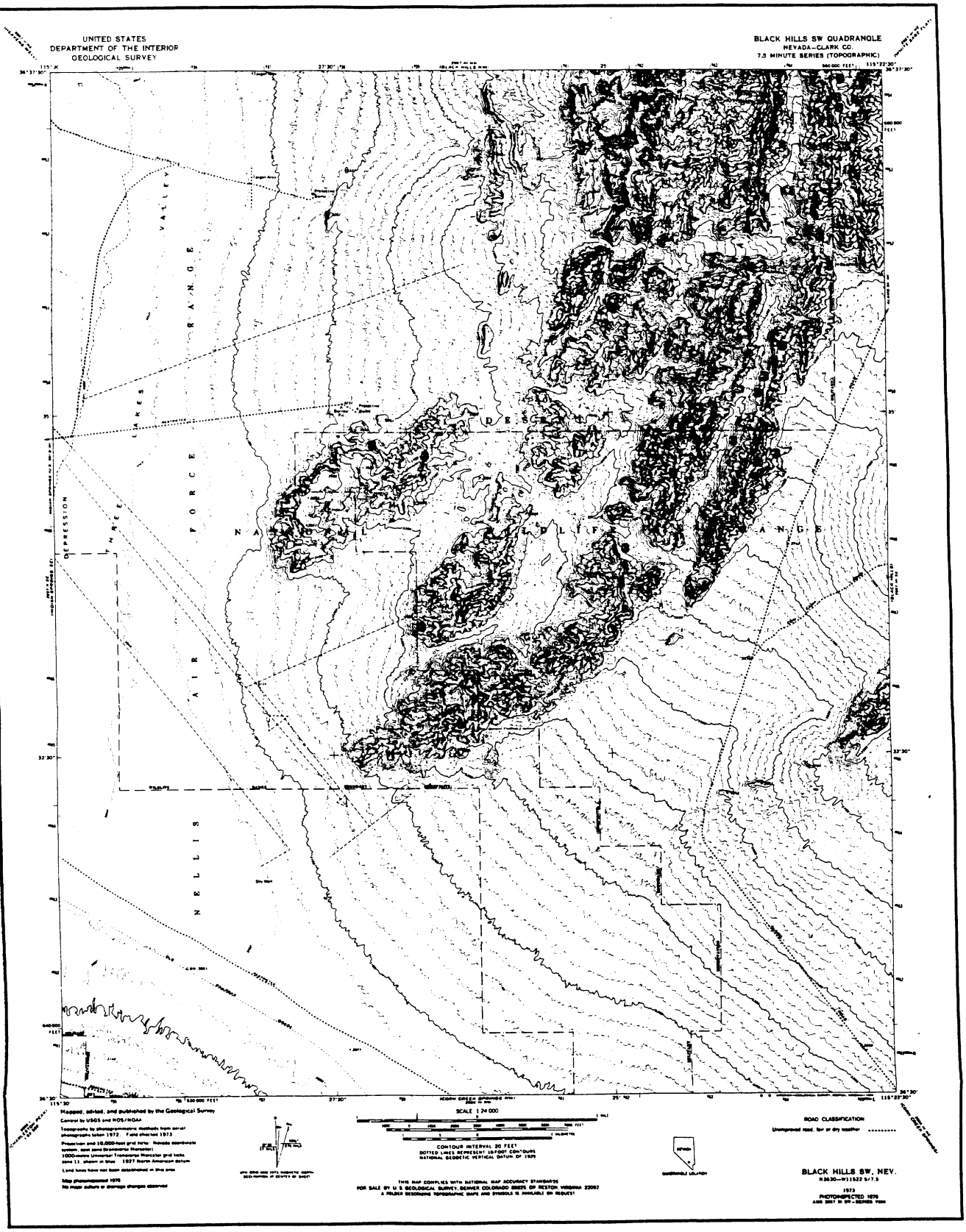
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ASOOCL	*Astragalus oophorus* var. *clokeyanus*	none



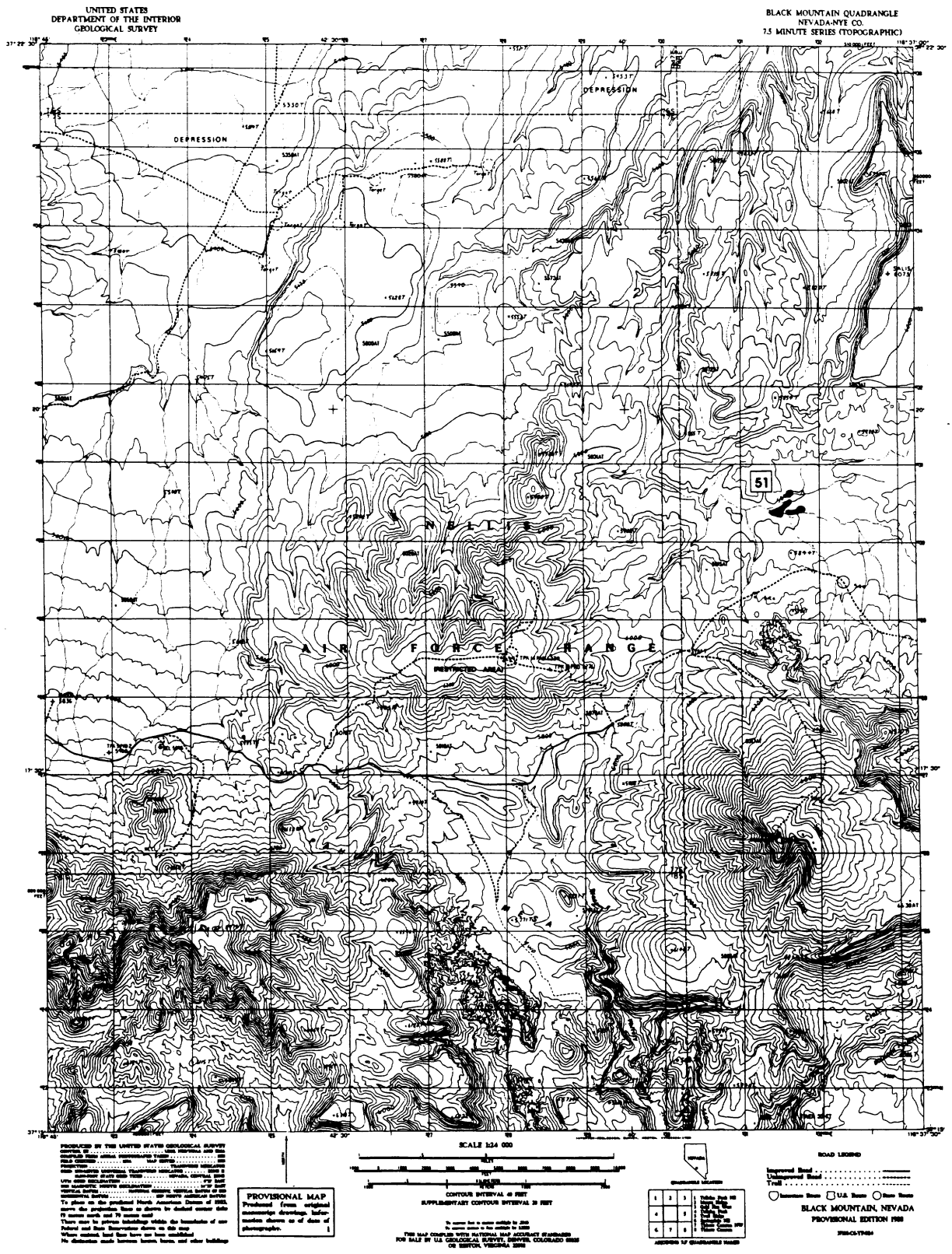
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3



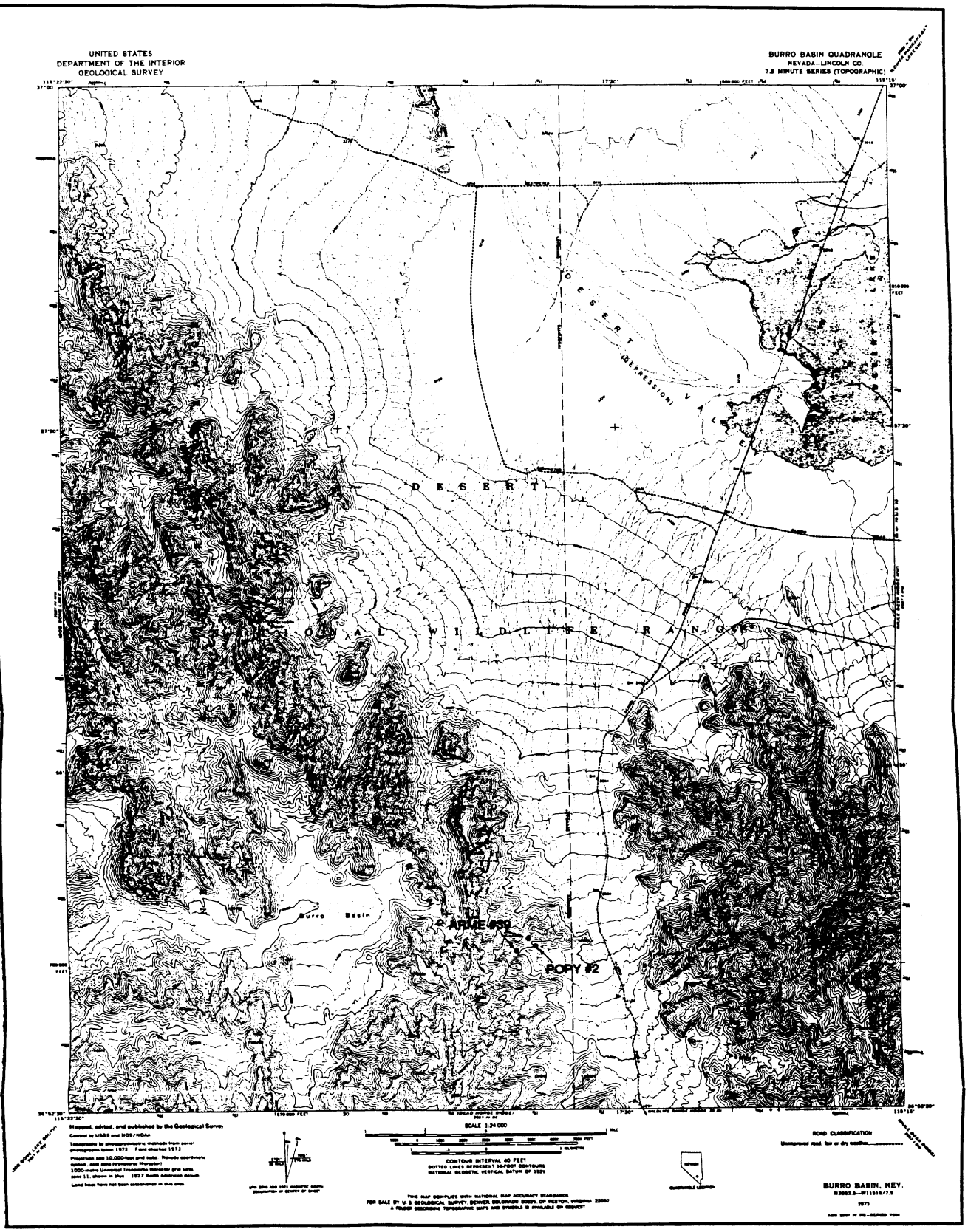
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Arctomecon merriamii*	3



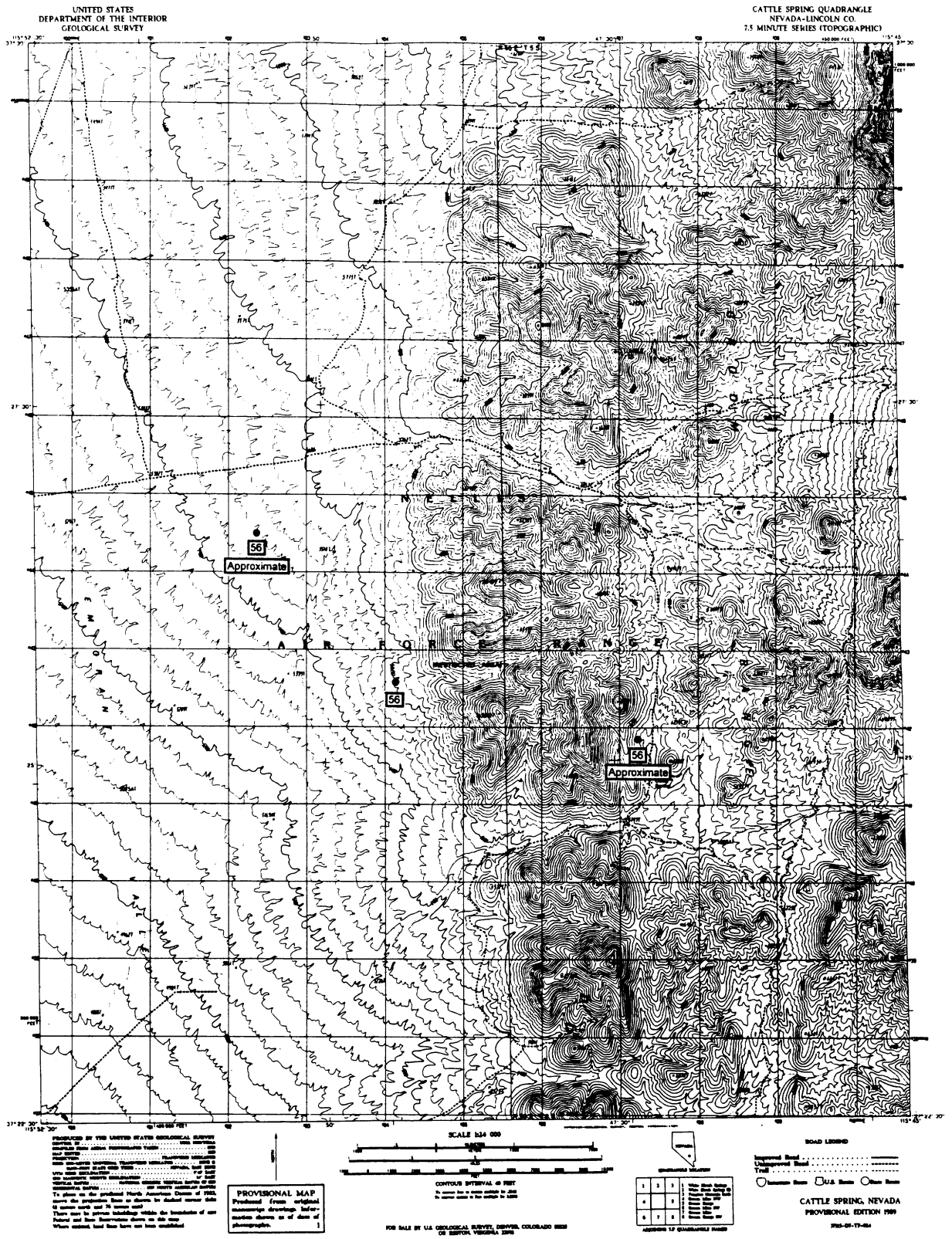
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Astragalus beatleyae*	51



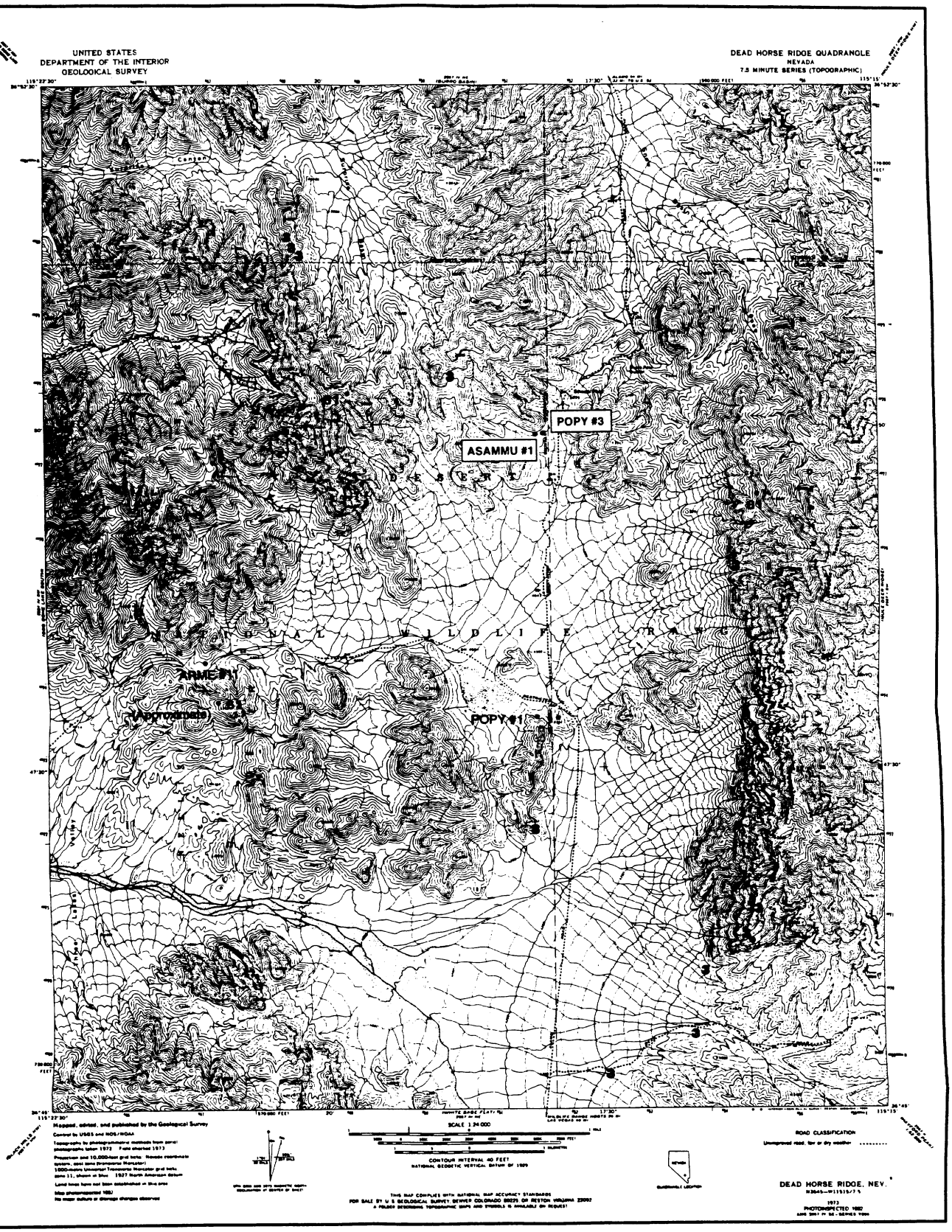
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	none
POPY	*Porophyllum pygmaeum*	none



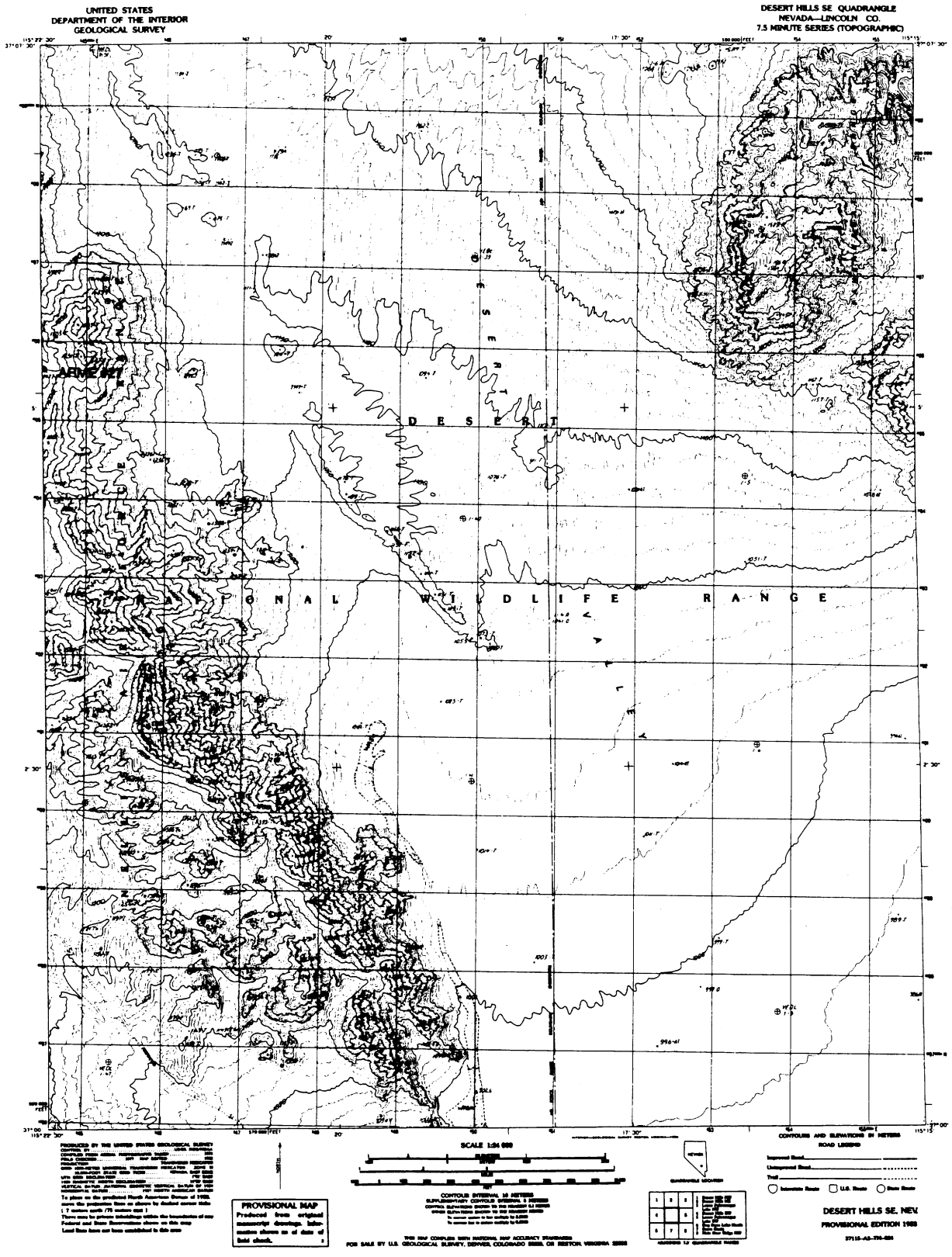
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Astragalus gilmanii*	56



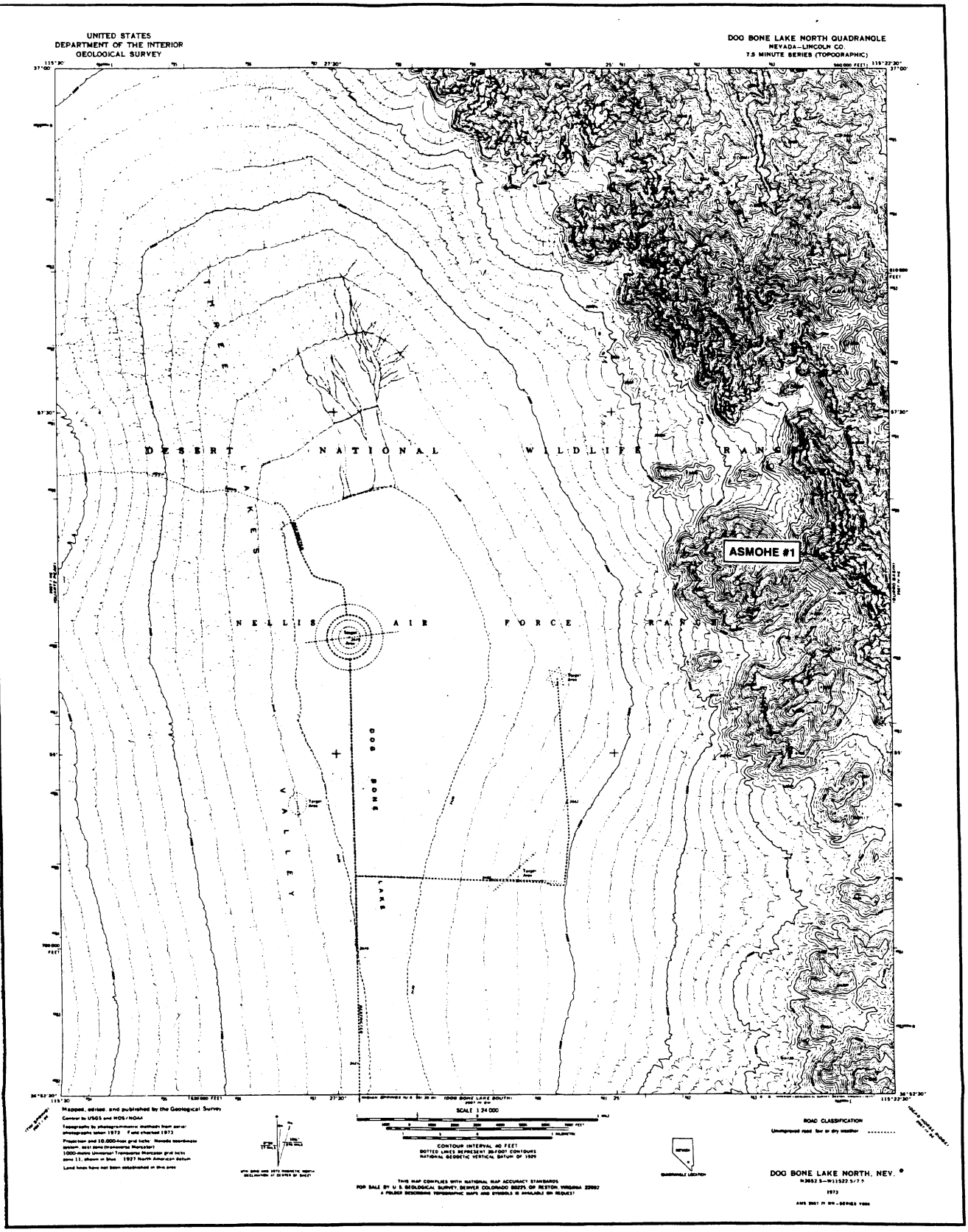
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
POPY	*Porophyllum pygmaeum*	61
ASAMMU	*Astragalus amphioxys var. musimonum*	none



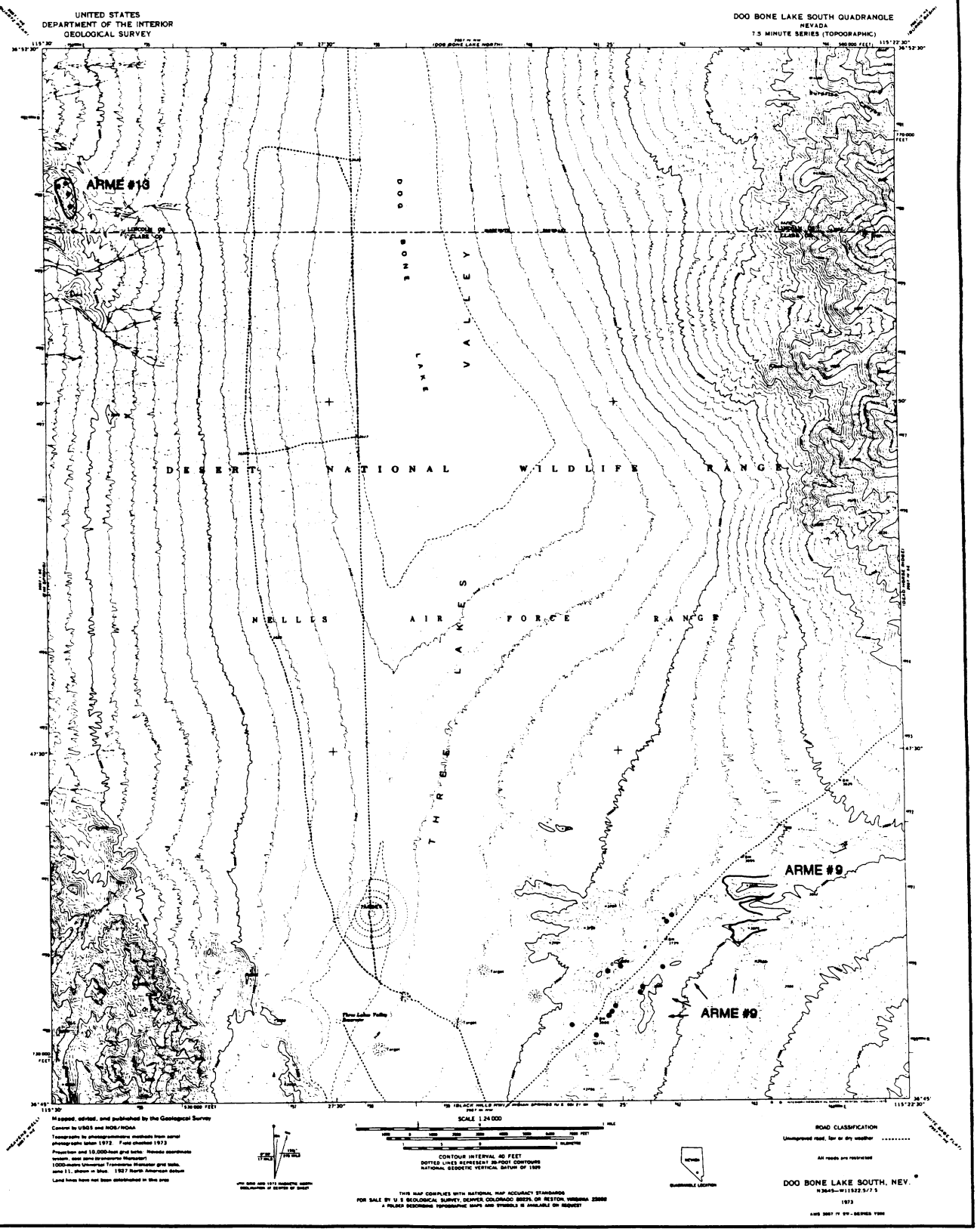
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	none



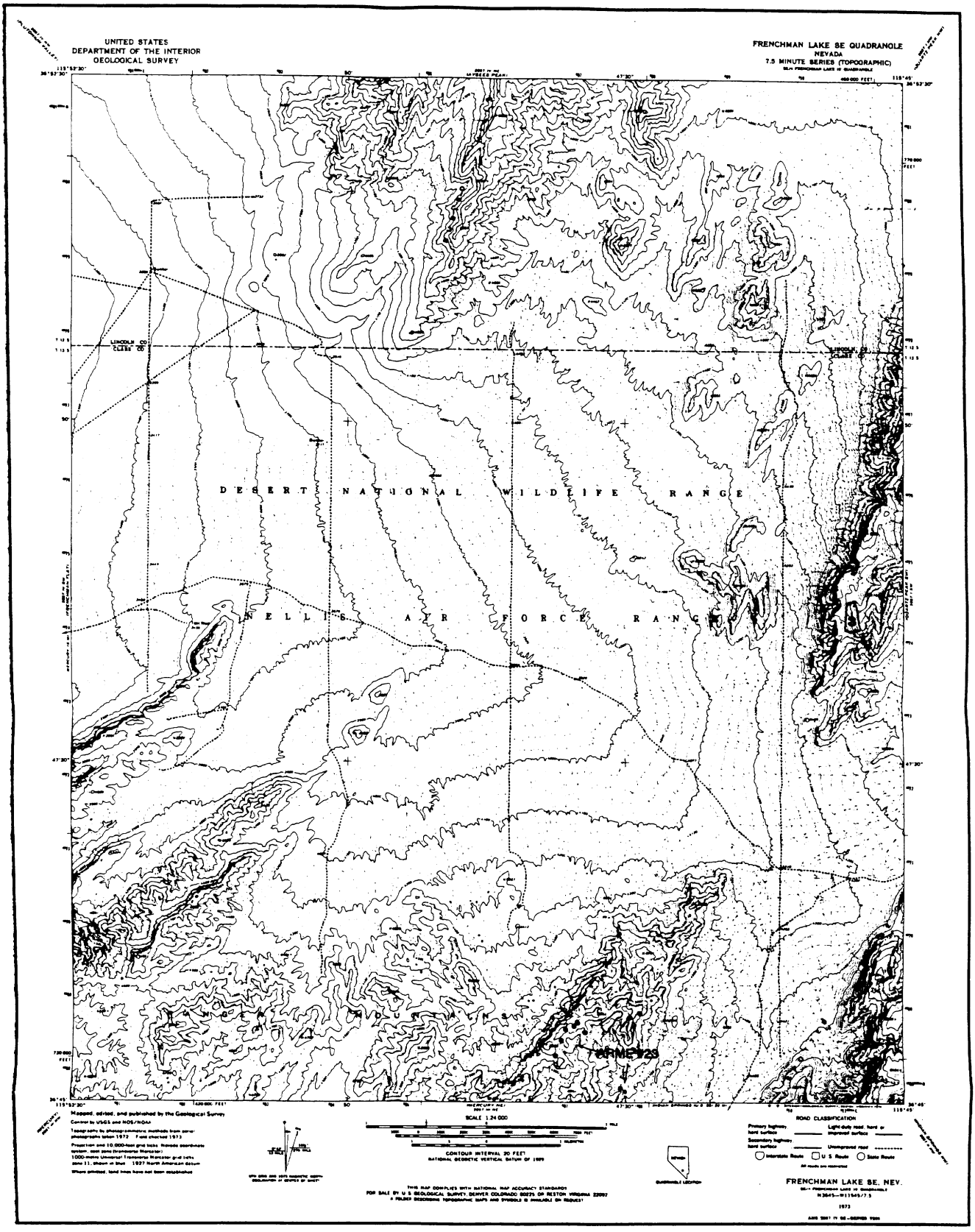
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ASMOHE	*Astragalus mohavensis* var. *hemigyrus*	none



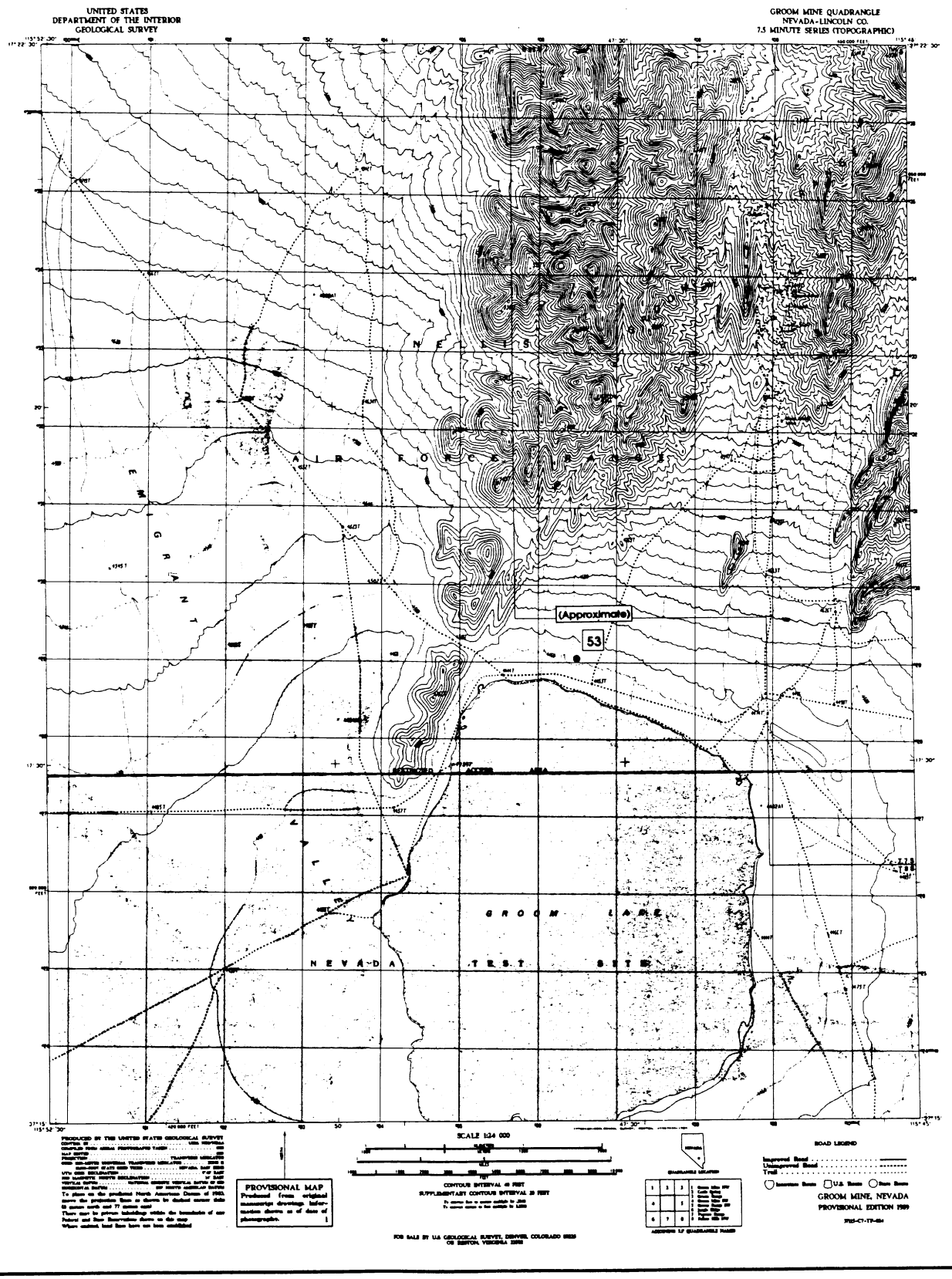
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	none



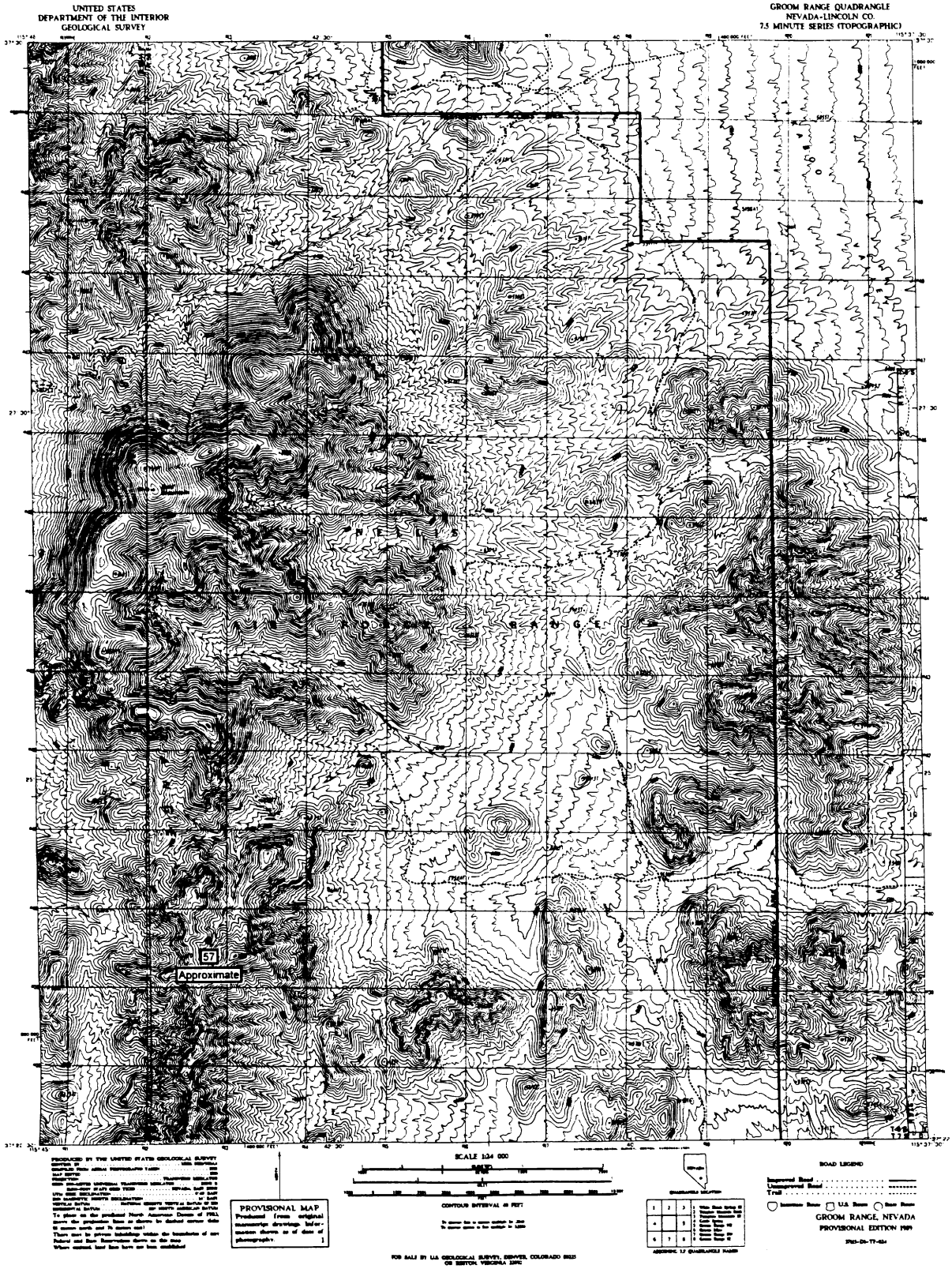
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3



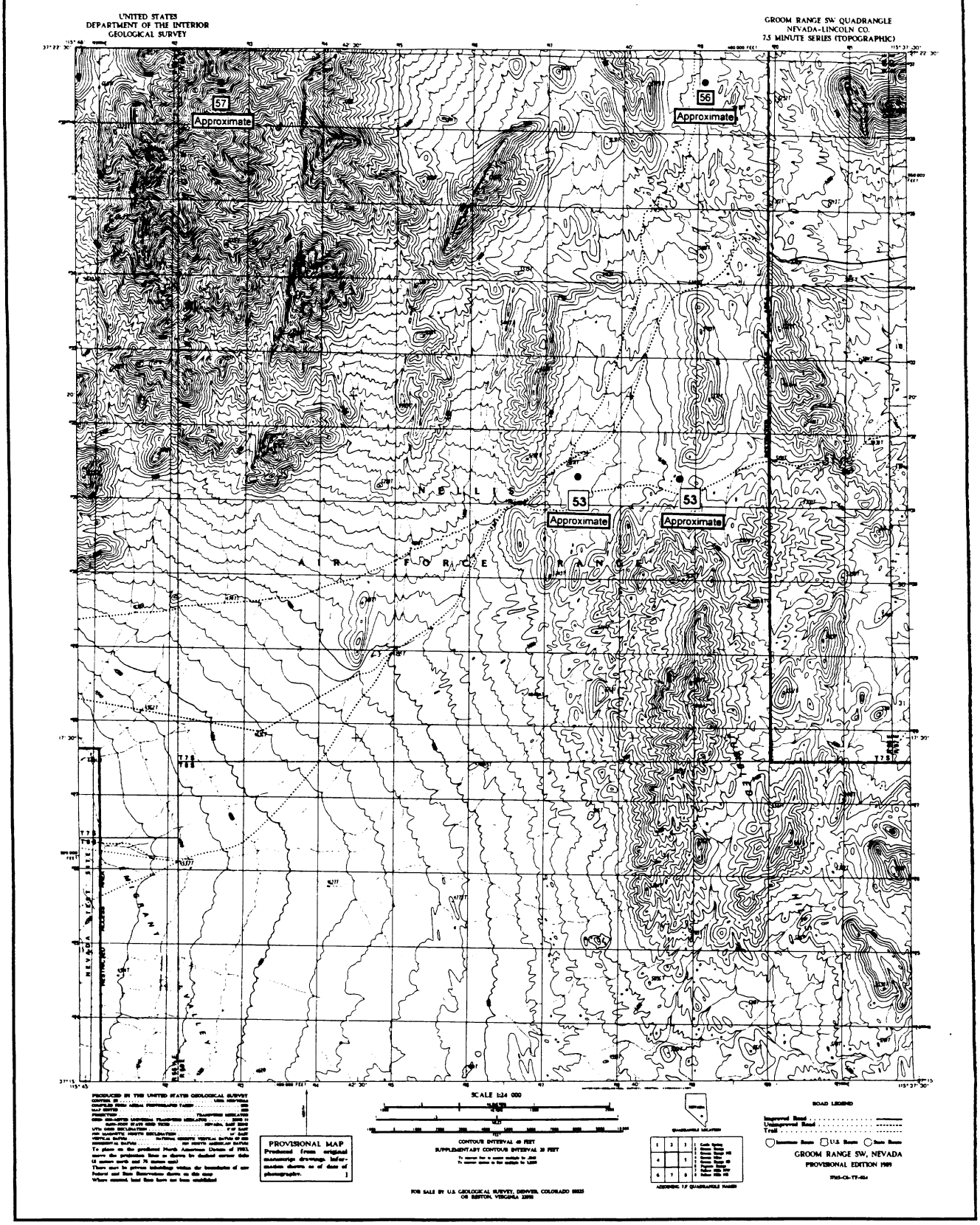
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Cymopterus ripleyi* var. *saniculoides*	53



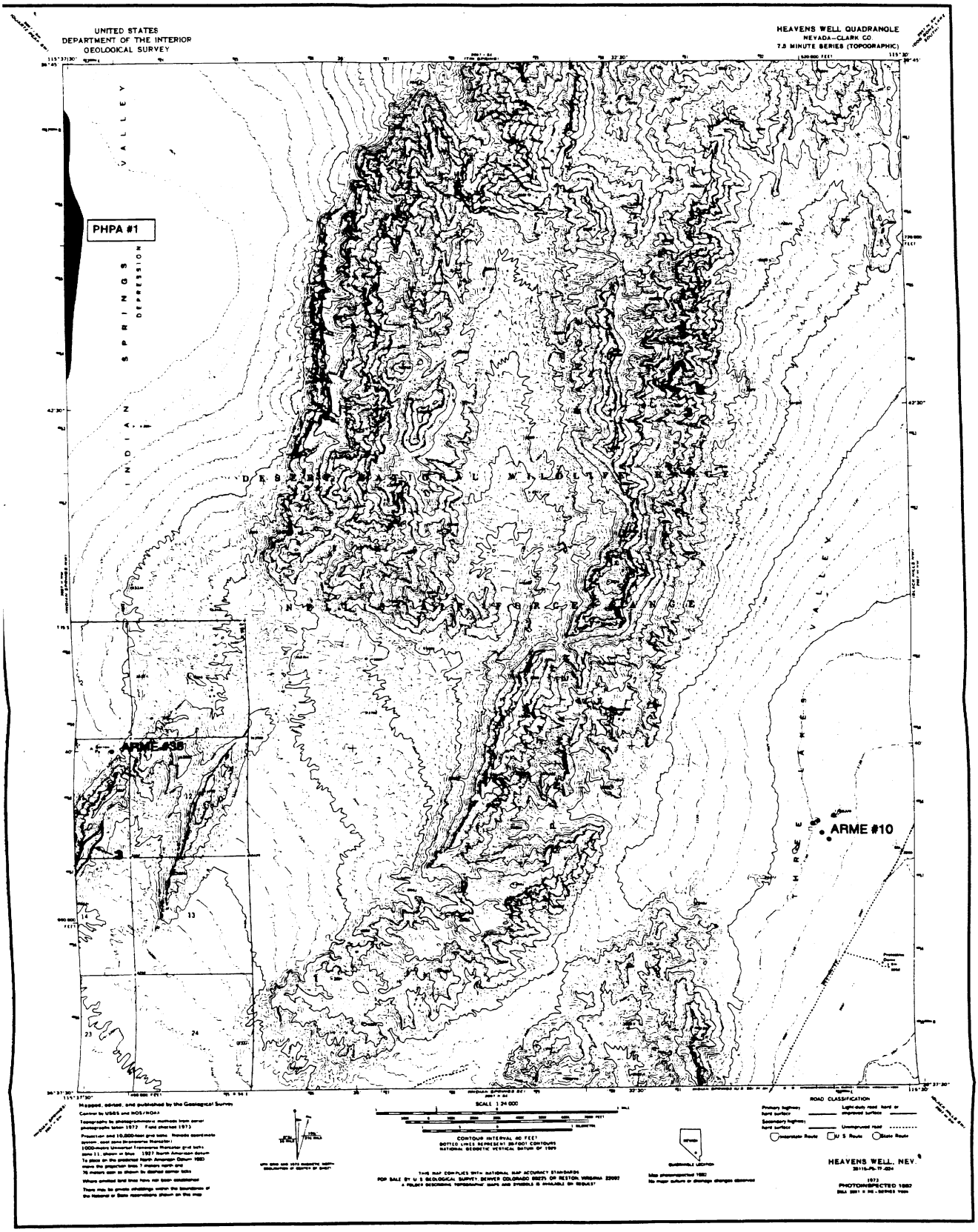
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Erigeron ovinus*	57



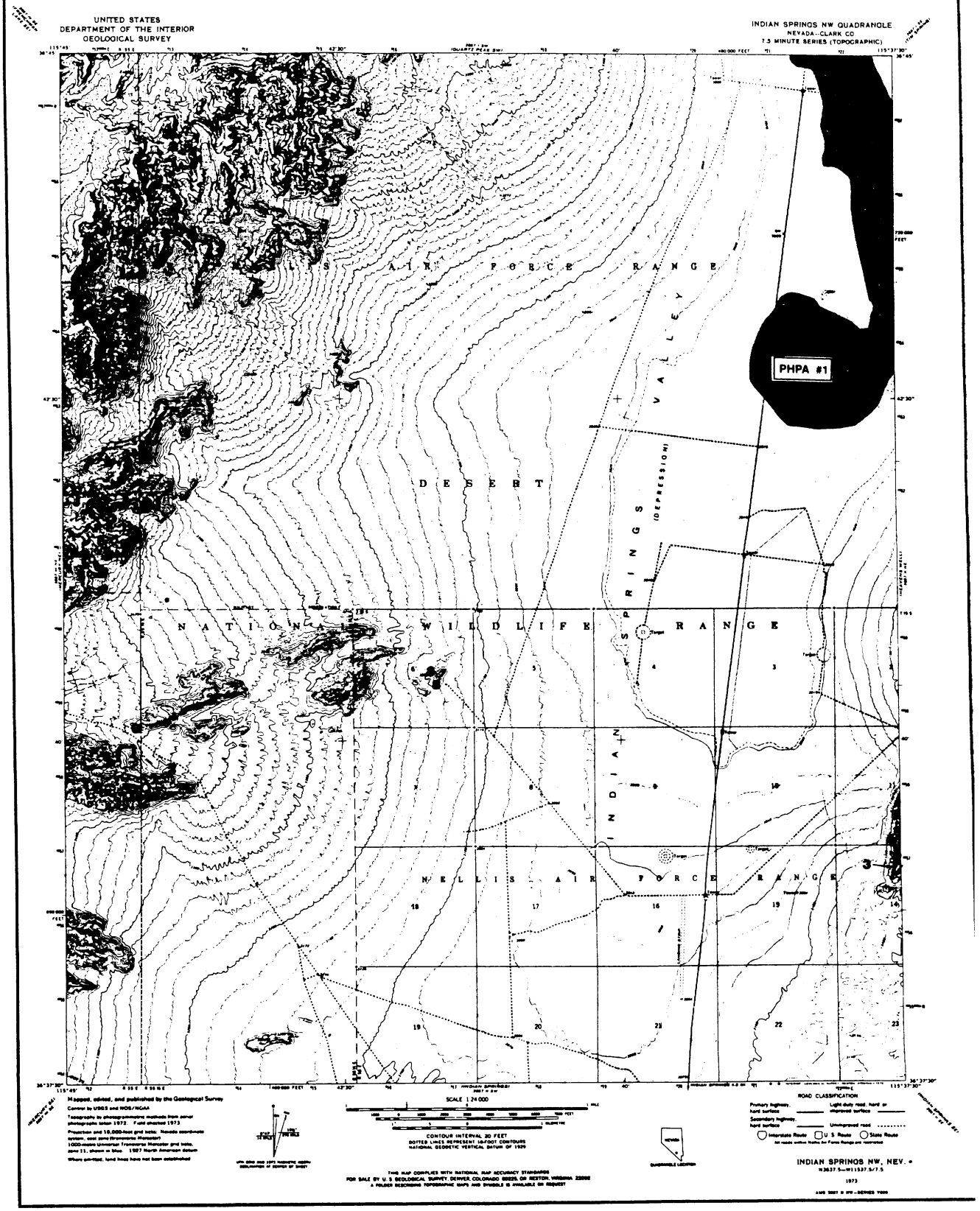
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Astragalus gilmanii*	56
none	*Cymopterus ripleyi* var. *saniculoides*	53
none	*Erigeron ovinus*	57



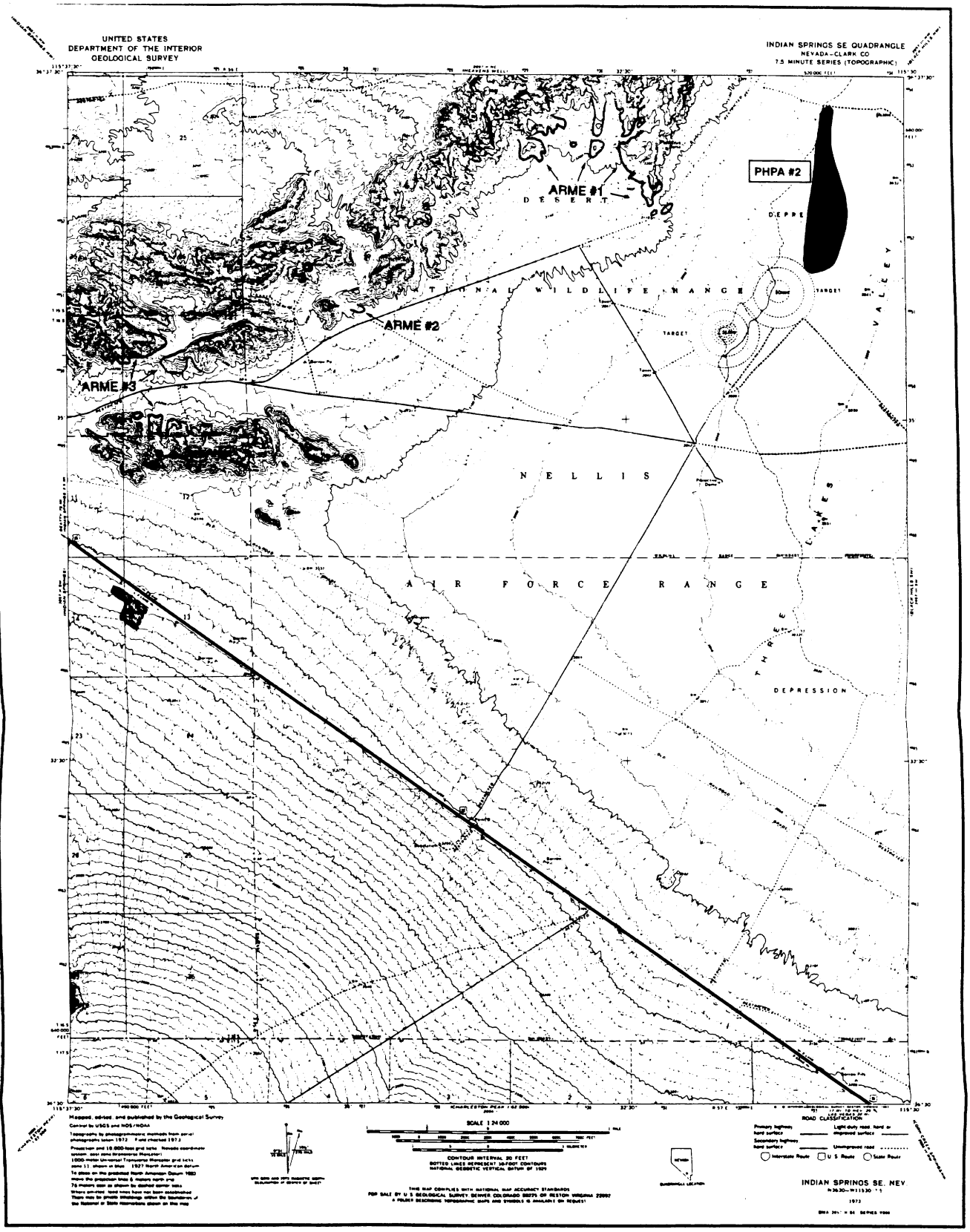
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
PHPA	*Phacelia parishii*	none



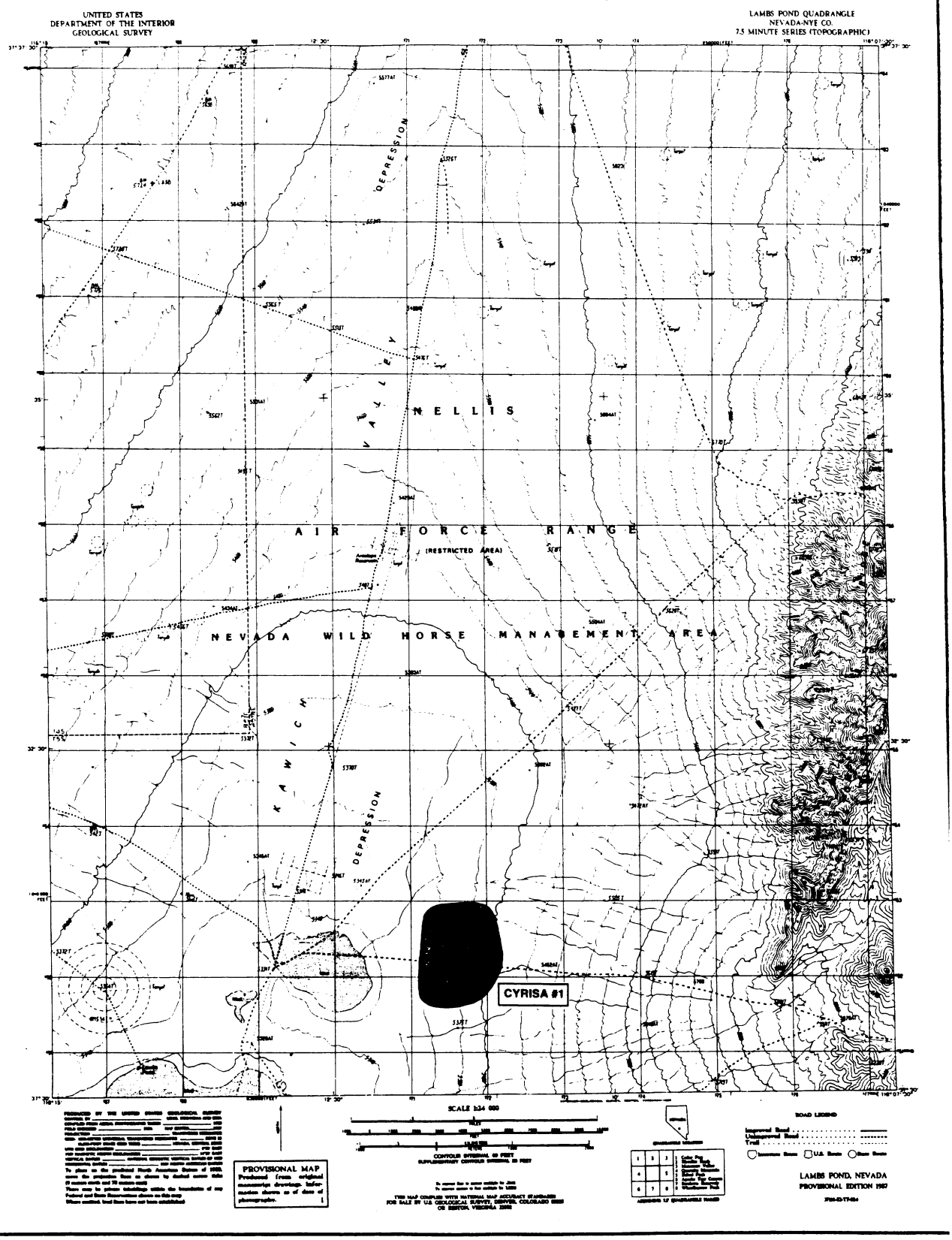
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Arctomecon merriamii*	3
PHPA	*Phacelia parishii*	none



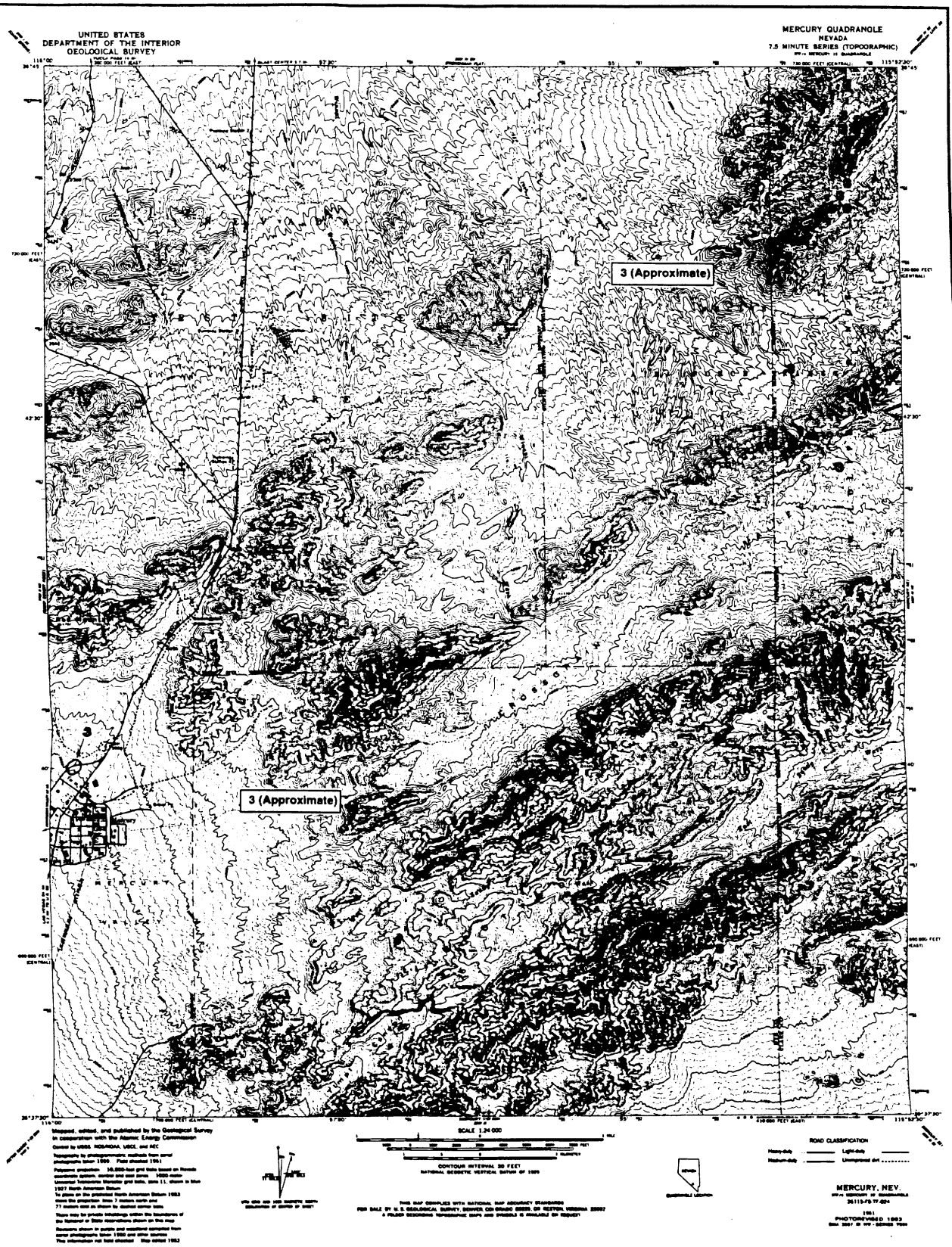
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
PHPA	*Phacelia parishii*	none



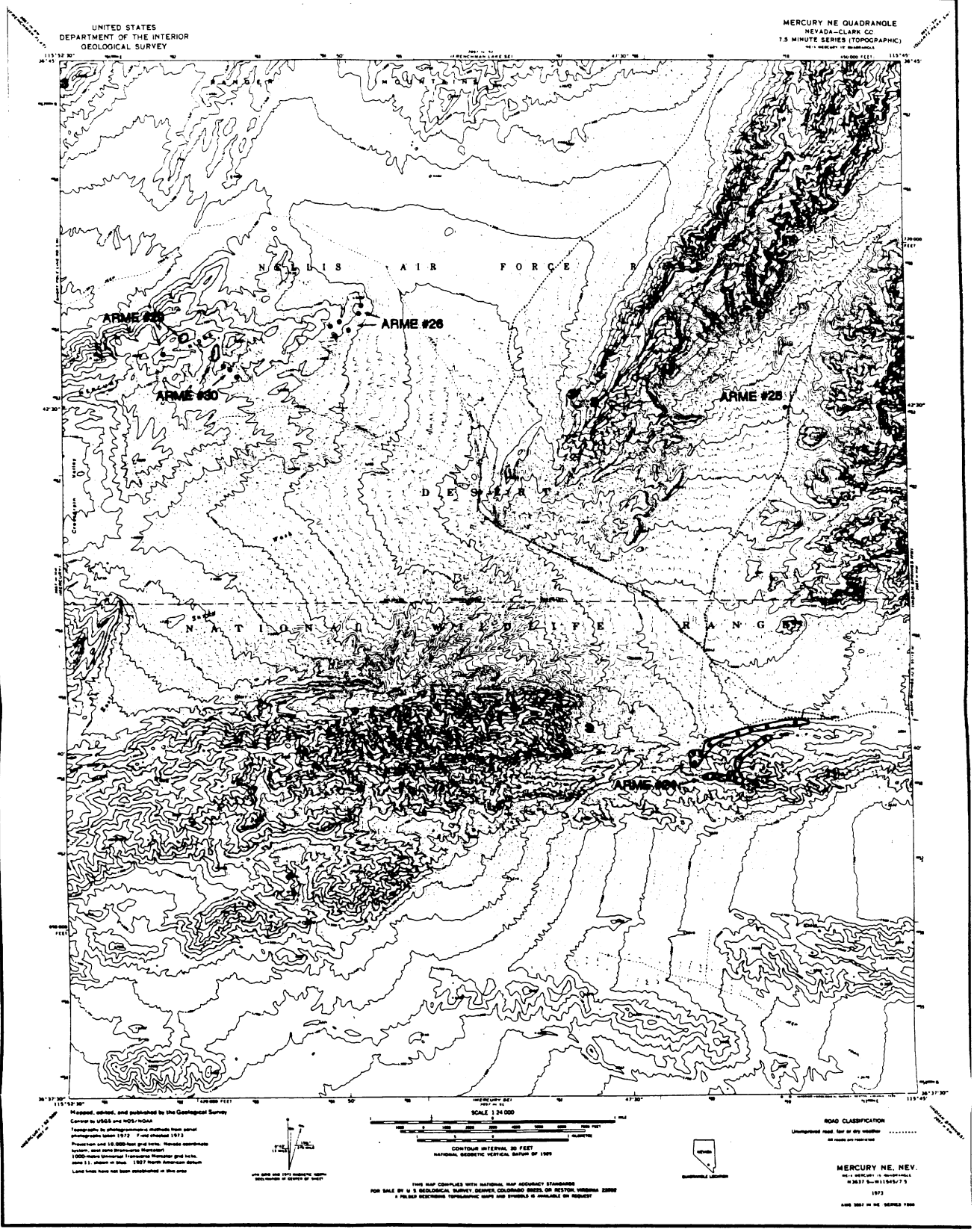
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
CYRISA	*Cymopterus ripleyi* var. *saniculoides*	none



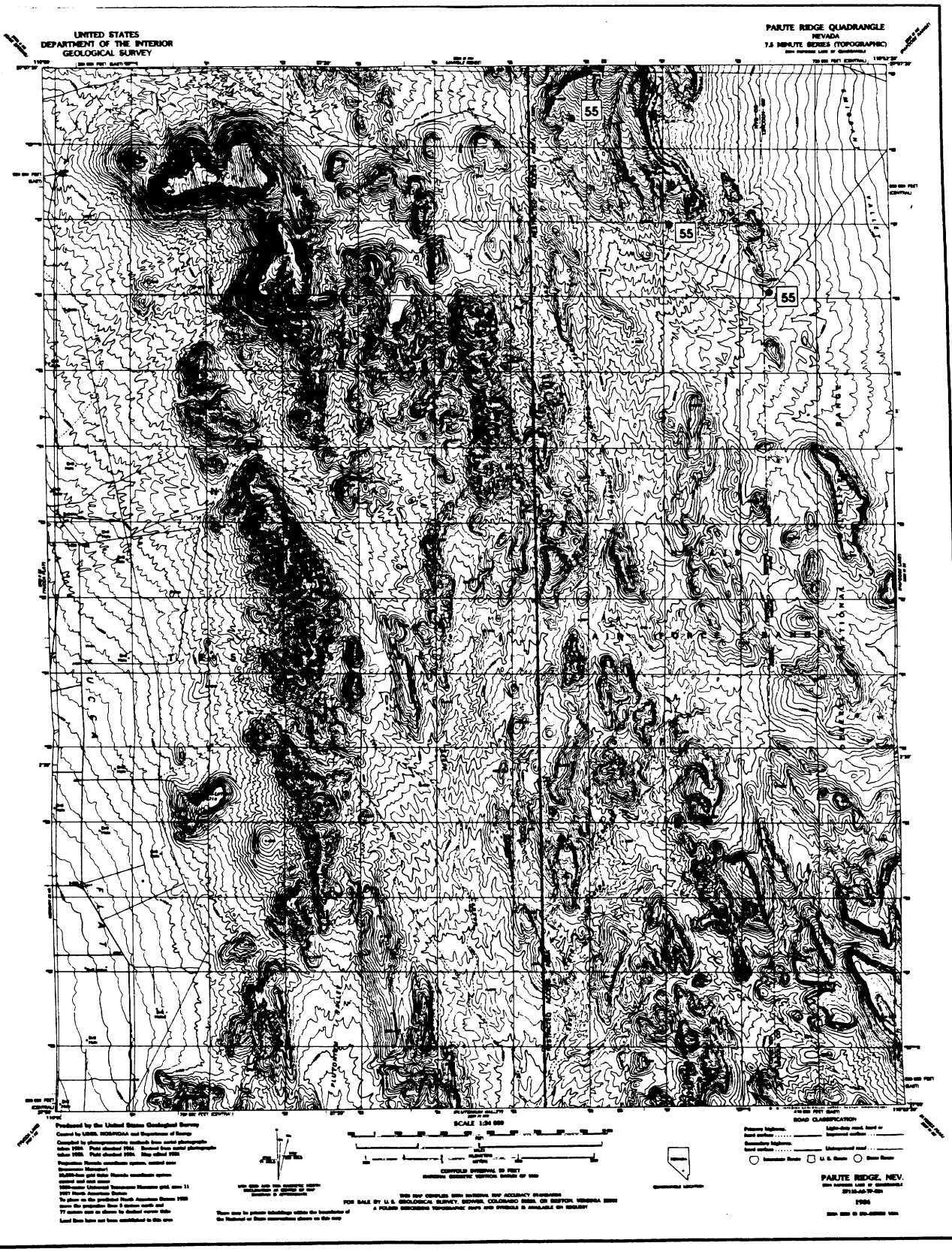
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Arctomecon merriamii*	3



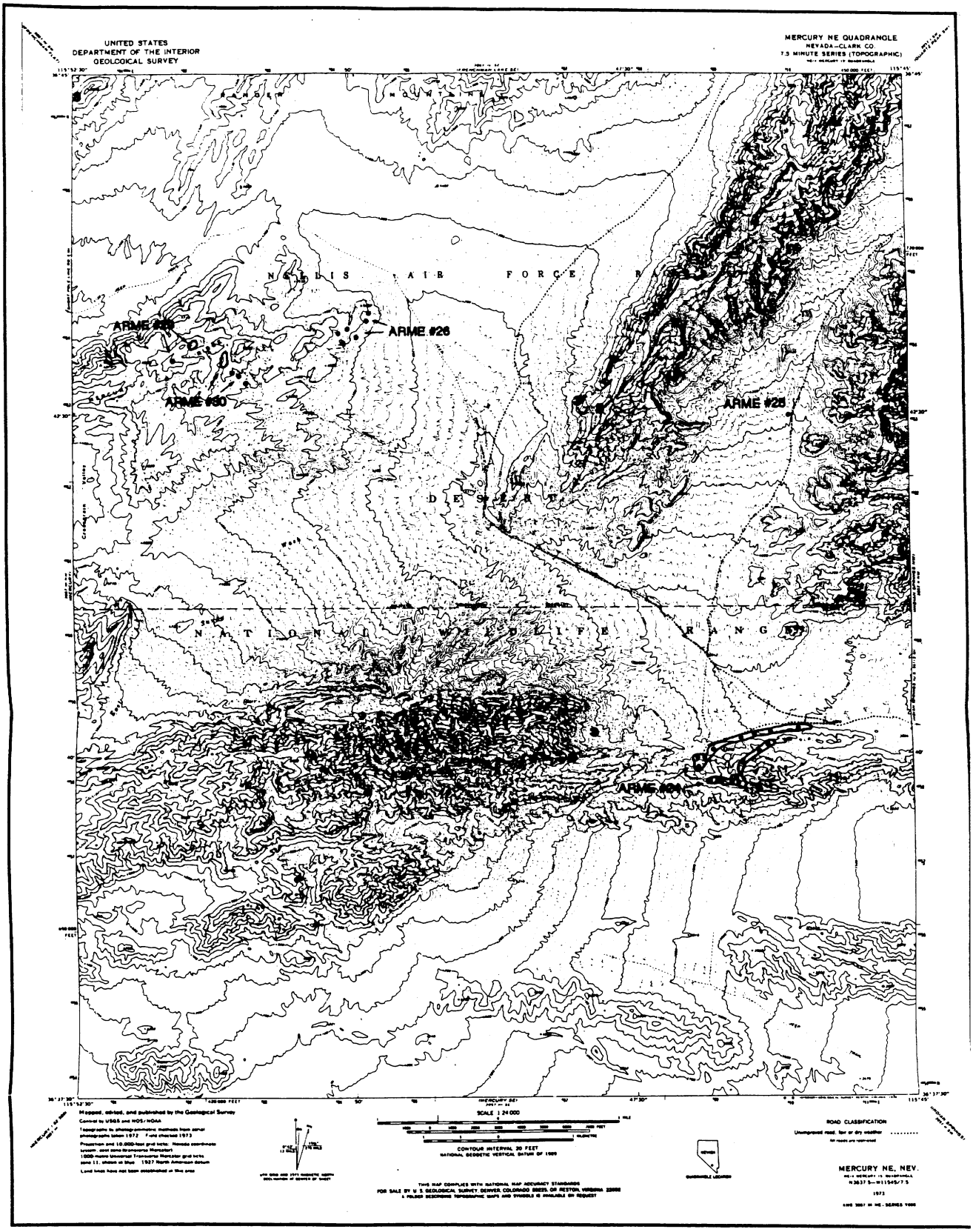
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3

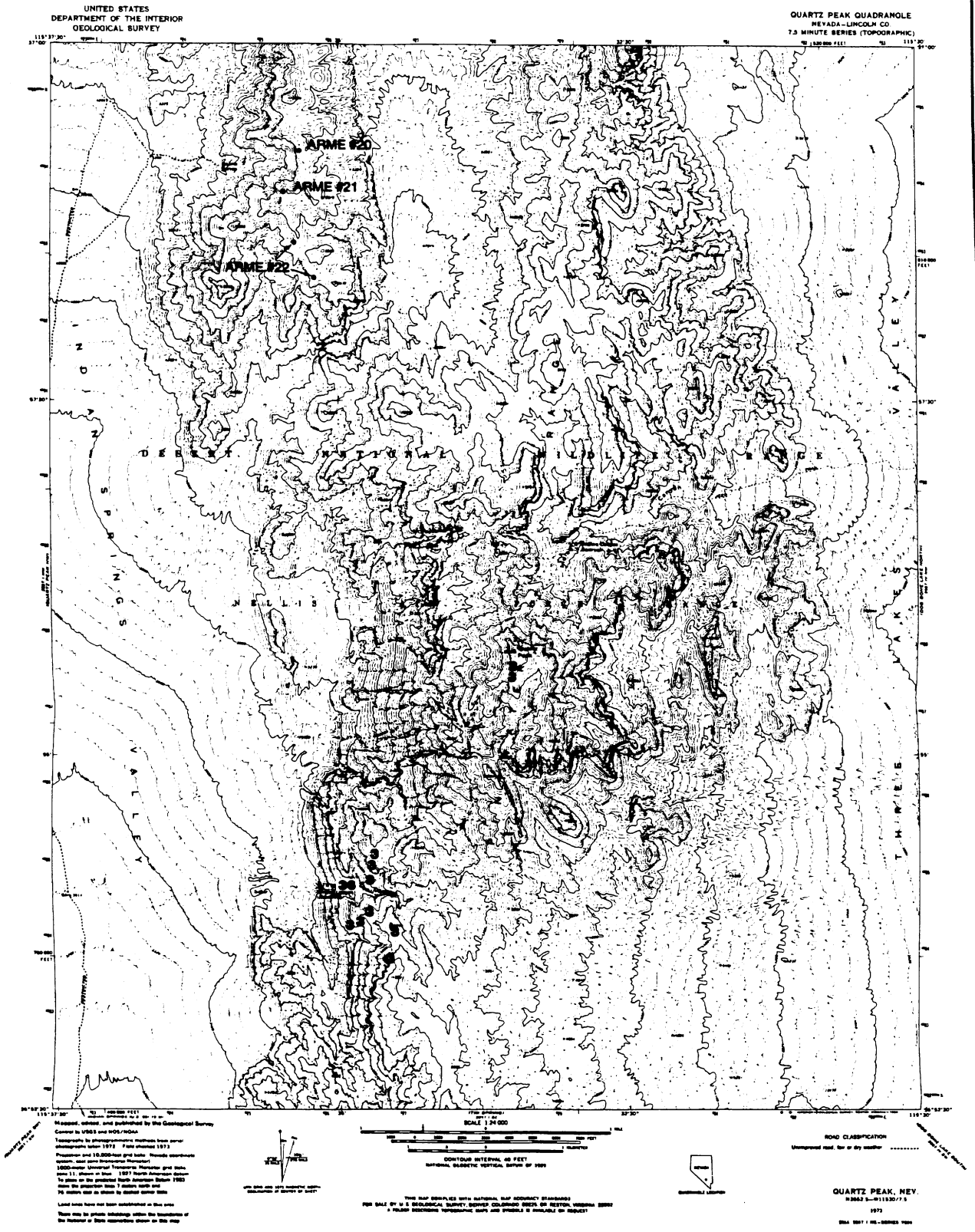


Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Phacelia beatleyae*	55

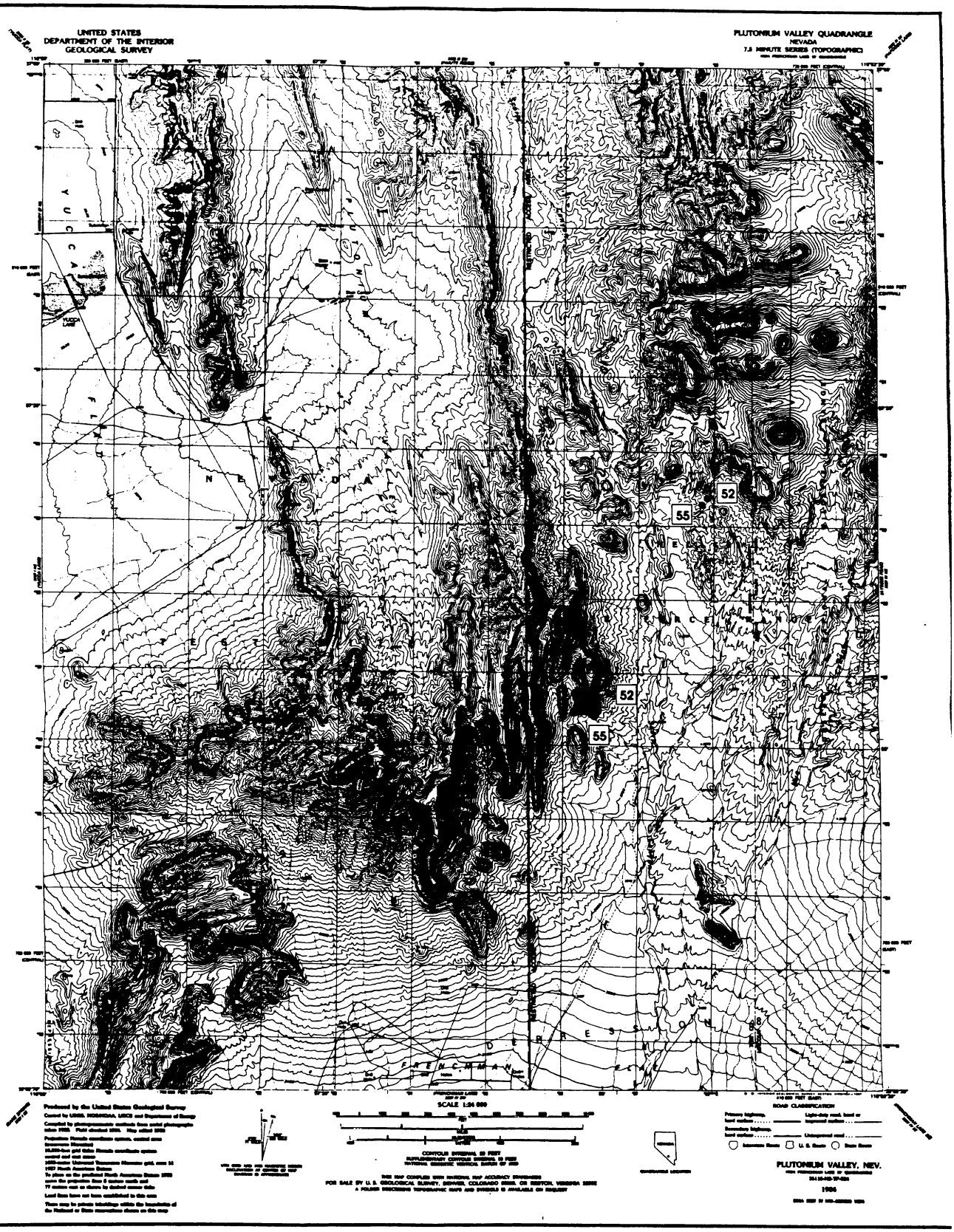


Threatened and Endangered Plant Survey Nellis Air Force Base Bombing and Gunnery Range		
The Nature Conservancy	**Species of Concern**	**Other Sources**
ARME	*Arctomecon merriamii*	3



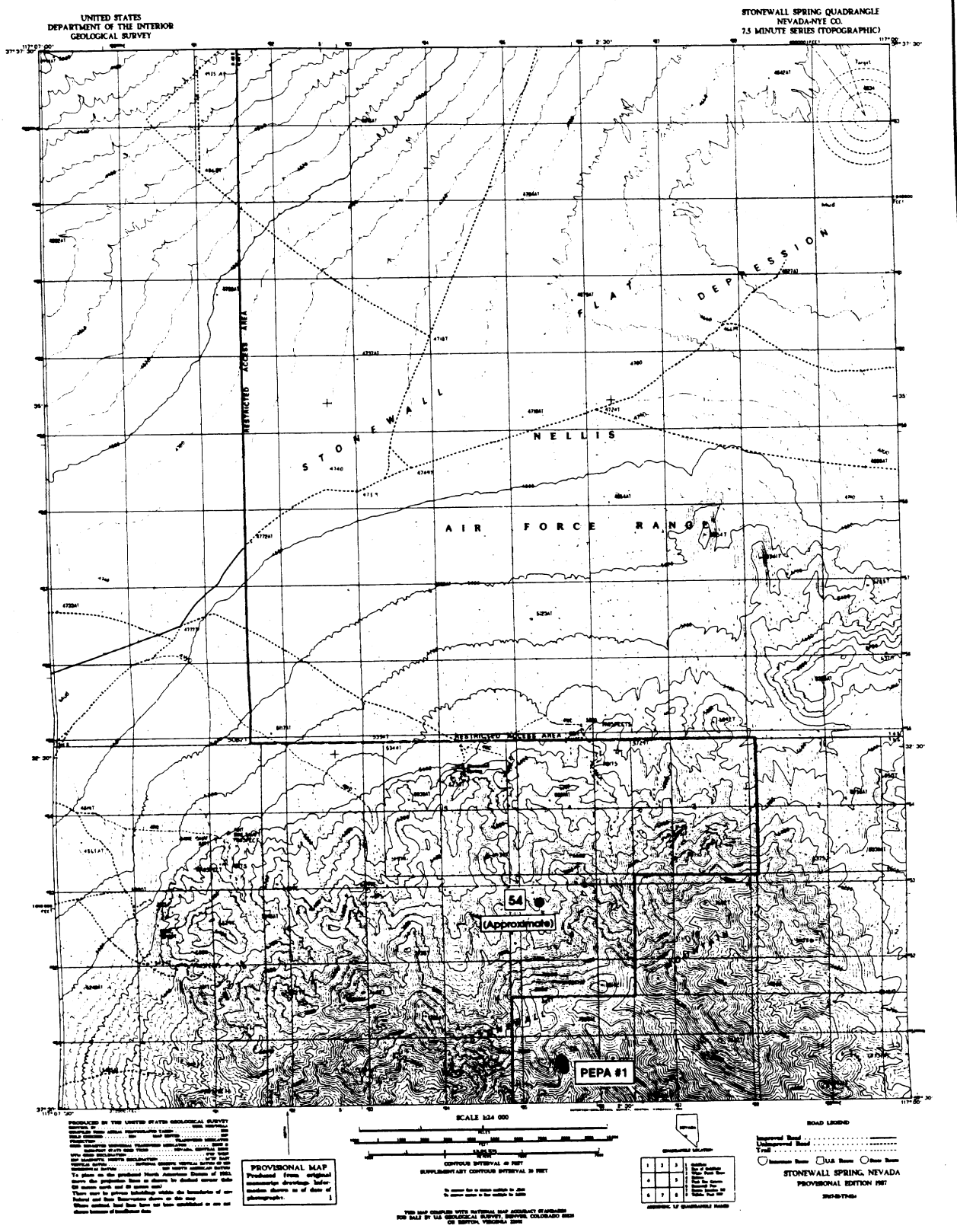
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
none	*Astragalus ackermanii*	36



Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

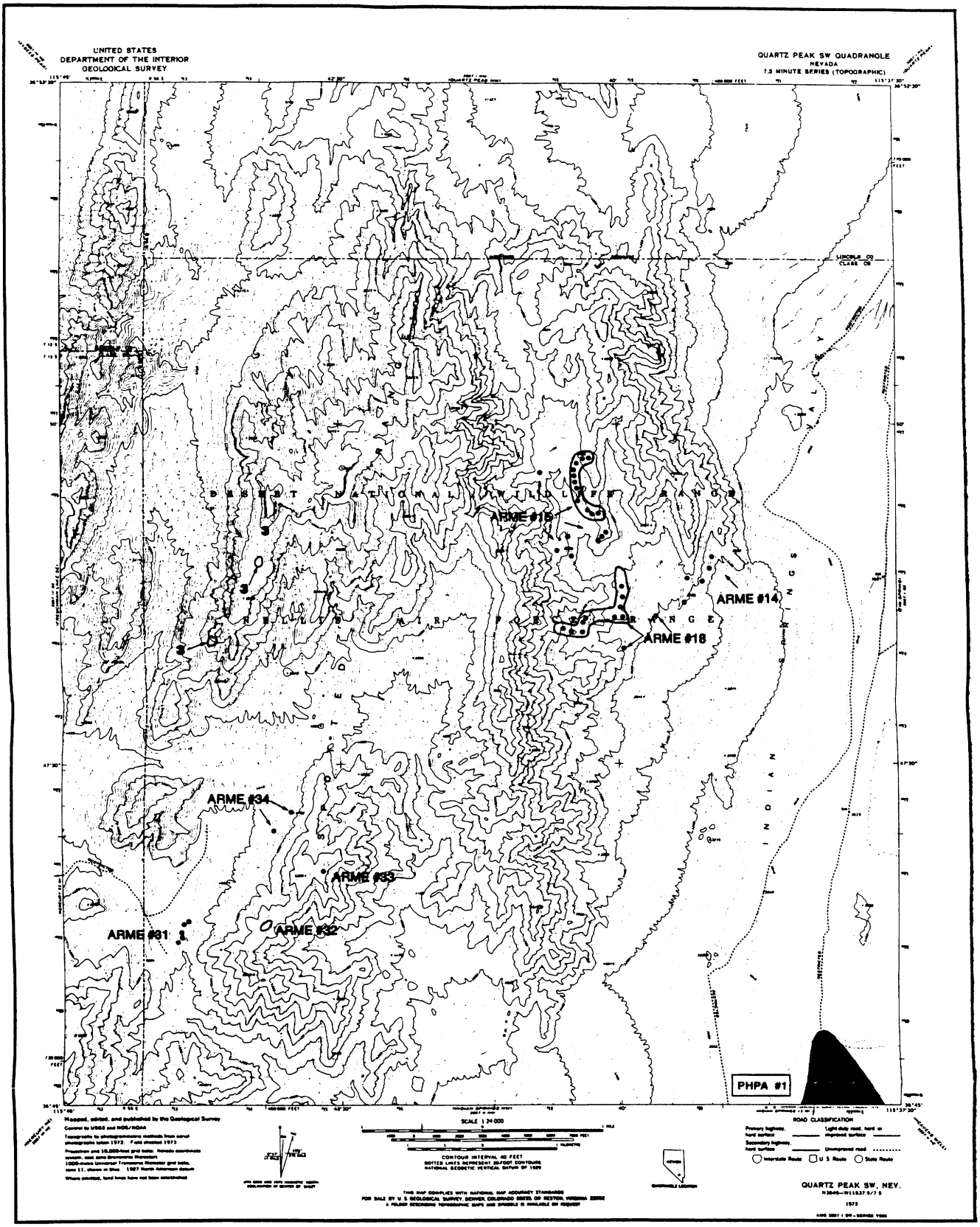
The Nature Conservancy	Species of Concern	Other Sources
none	*Astragalus funereus*	52
none	*Phacelia beatleyae*	55



Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

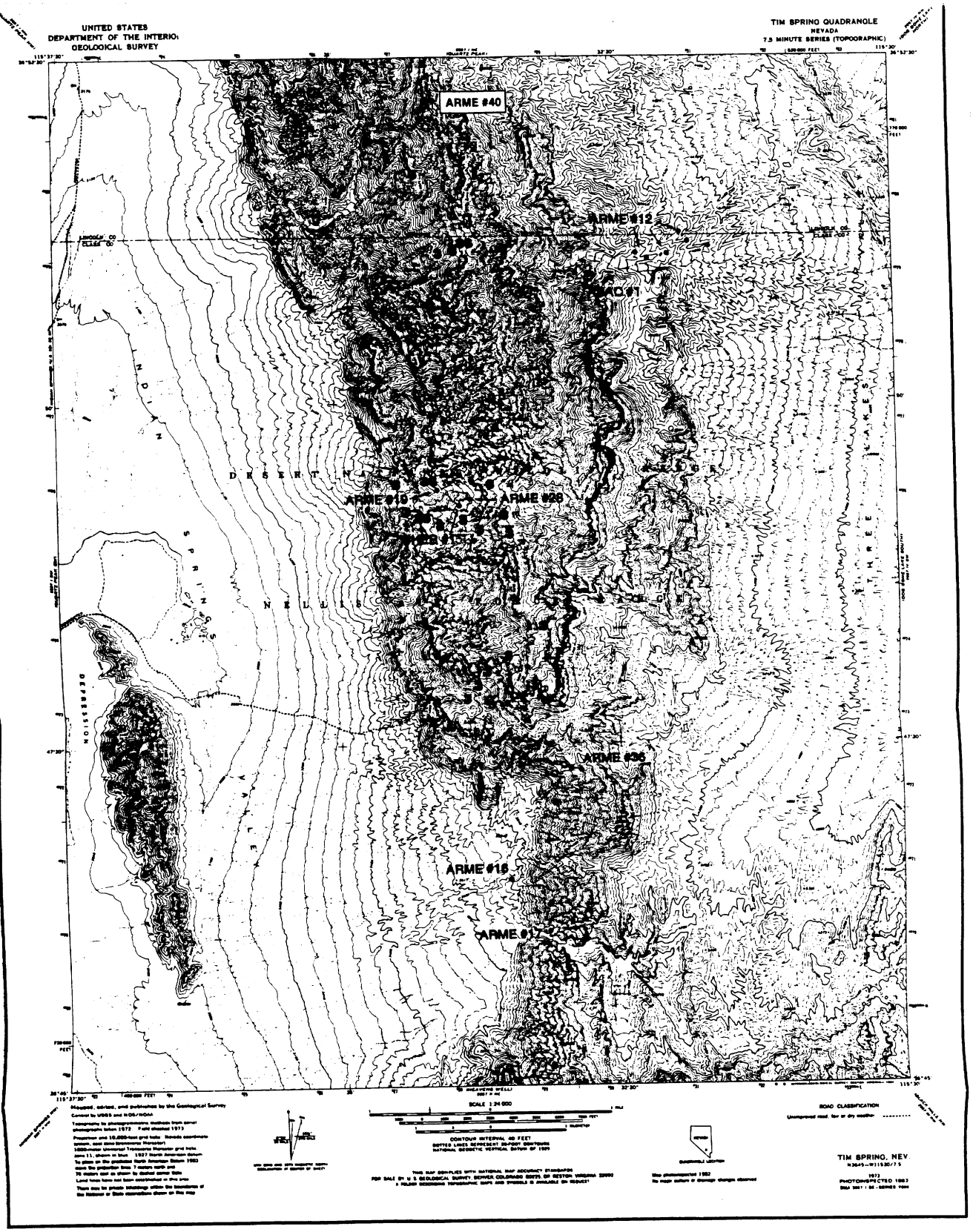
The Nature Conservancy	Species of Concern	Other Sources
PEPA	*Penstemon pahutensis*	54

548



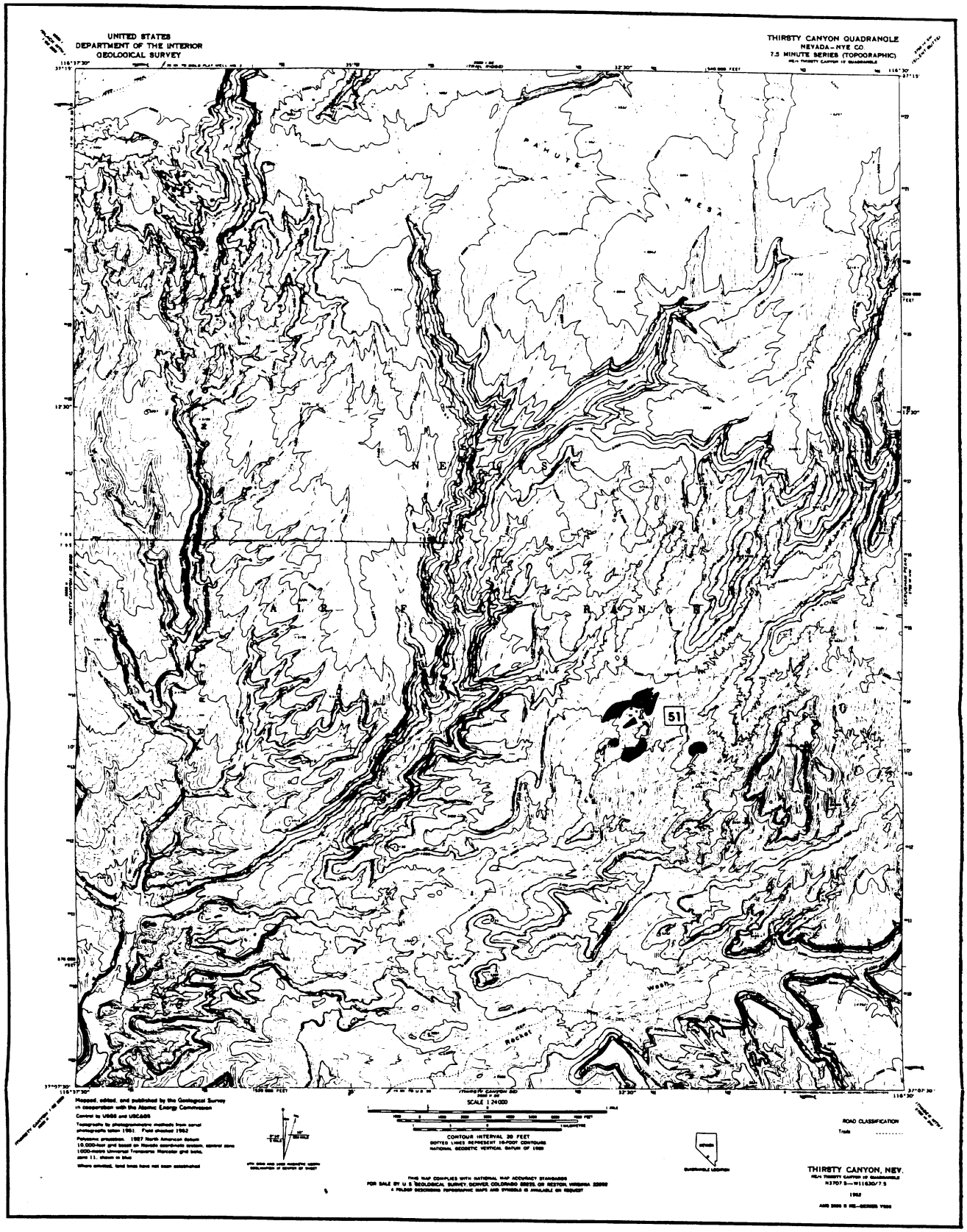
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
PHPA	*Phacelia parishii*	none



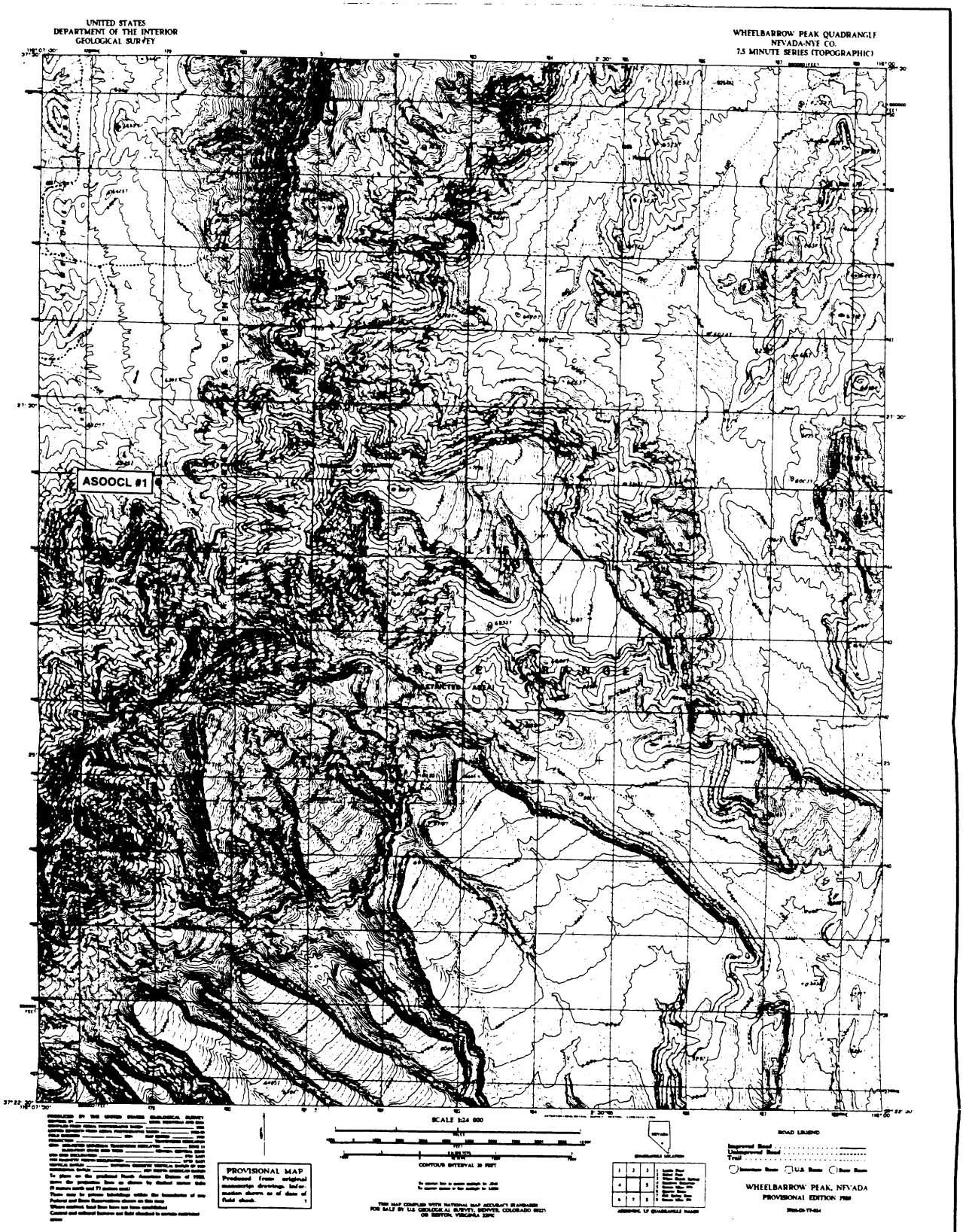
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
ASAC	*Astragalus ackermanii*	36
CHER	*Chrysothamnus eremobius*	none



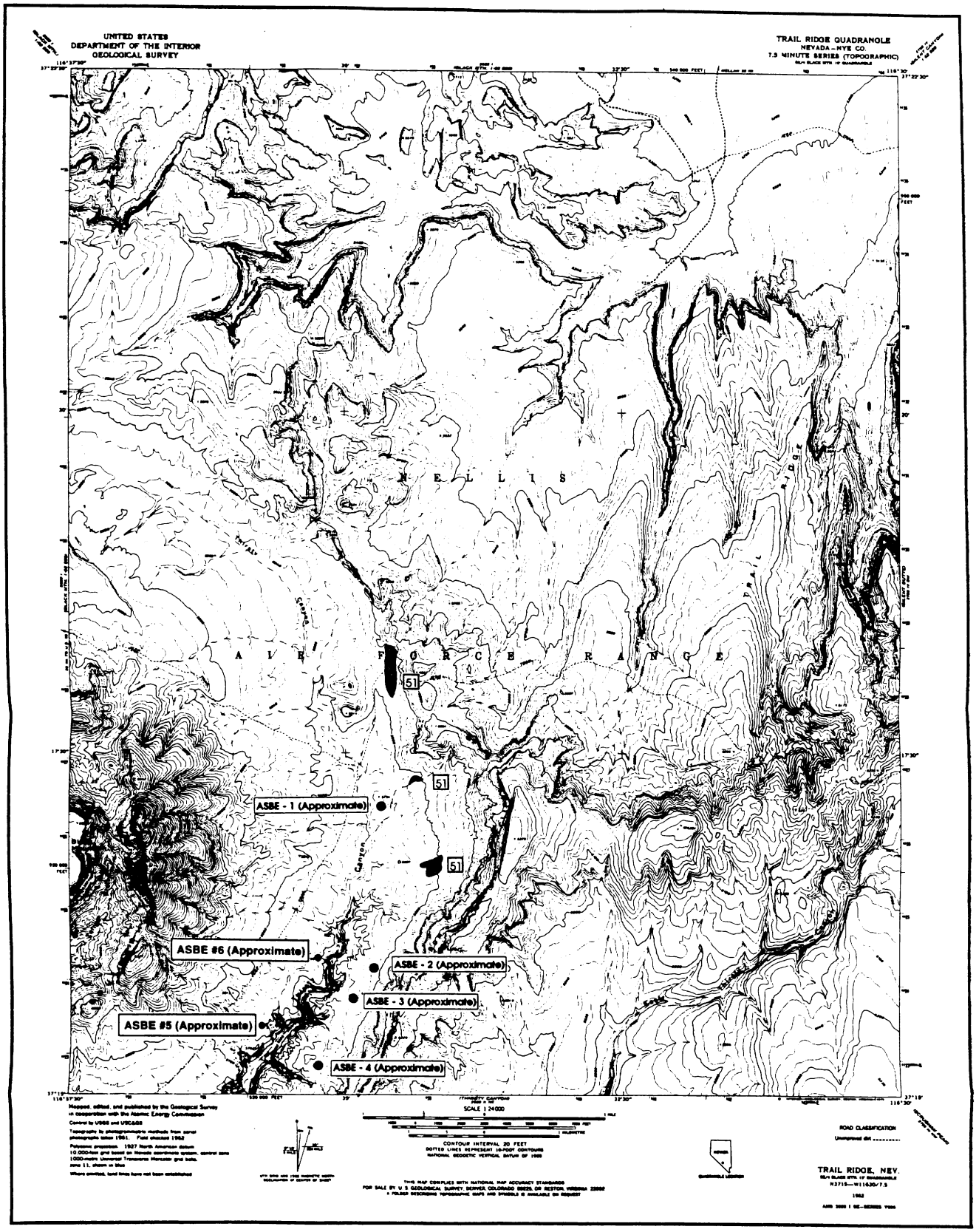
Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
none	*Astragalus beatleyae*	51

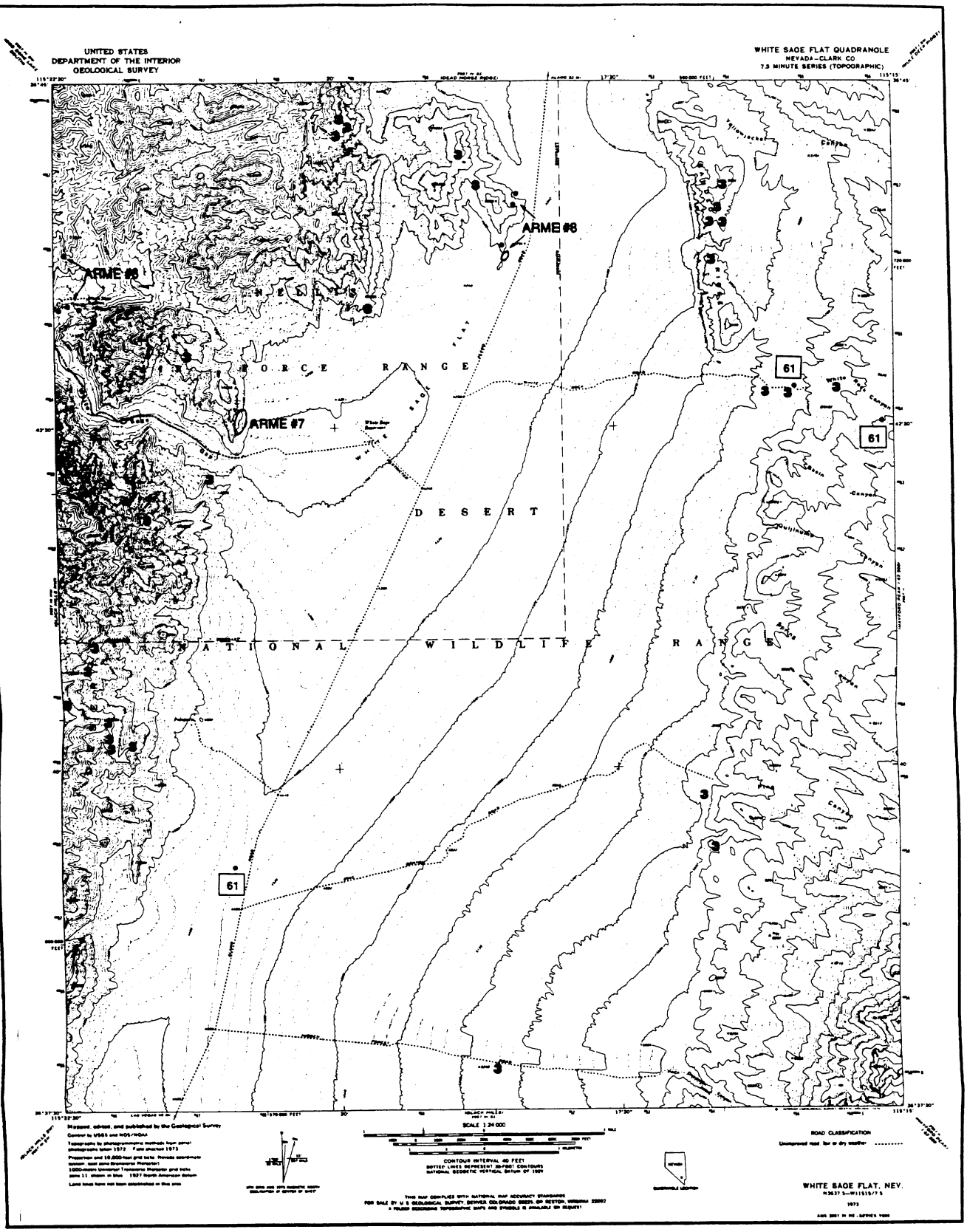


Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ASOOCL	*Astragalus oopharus* var. *clokeyanus*	none



Threatened and Endangered Plant Survey Nellis Air Force Base Bombing and Gunnery Range		
The Nature Conservancy	**Species of Concern**	**Other Sources**
ASBE	*Astragalus beatleyae*	51



Threatened and Endangered Plant Survey
Nellis Air Force Base
Bombing and Gunnery Range

The Nature Conservancy	Species of Concern	Other Sources
ARME	*Arctomecon merriamii*	3
none	*Porophyllum pygmaeum*	61

Appendix G-2
Field Data on Surface Water Resources of the Nellis Air Force Range
(Baker Environmental and Dames & Moore 1996)

Note: Reference EIS Figure 3.8-1 and Table 3.8-1.

ID#	Date	Name	Lat/Long	Elevation	WR type	IP	OL	OW	AD	DR	SSD	EFV	EVSW	ST	SSP
1	2/4/96	Cliff Spring	37 31.96' 00" / 116 5.25' 00"	2100	S, MTP, PA	Y	1.52	1.1	2.29	2.29	NA	NA	372	BR, GSL	N
2	3/2/96	Johnnies Water	37 26.2' 00" / 116 4.4' 00"	2000	S	N	NA	NA	NA	NA	NA	NA	NA	RGSL	N
3	3/2/96	Sand Spring	36 49.51' 00" / 115 34.07' 00"	1300	S	N	NA	NA	NA	NA	NA	NA	NA	RA	N
4	3/2/96	Tim Spring	36 50.92' 00" / 115 34.14' 00"	1450	S	N	NA	NA	NA	NA	NA	NA	NA	RA	N
5	3/2/96	Quartz Spring	36 59.13' 00" / 115 35.97' 00"	1450	S	N	NA	NA	NA	NA	NA	NA	NA	RA	N
6	3/2/96	Antelope Reservoir	37 33.75' 00" / 116 12' 00"	1650	MMP	N	31	31	6.1	6.1	NA	NA	NA	CL	N
7	4/27/96	Georges Water	37 51.9' 00" / 116 20.9' 00"	2150	S	N	NA	NA	NA	NA	NA	NA	NA	RGSL	N
8	4/27/96	Phantom Seep	37 51.5' 00" / 116 22' 00"	2300	SIW	Y	18.3	0.9	0.2	0.4	18.3	0.47	329	SSCL	Y
9	4/27/96	Indian Spring	37 26.9' 00" / 116 5.5' 00"	2050	S, PA	Y	4.6	0.9	0.63	1.27	3.35	NA	261	RGSL	Y
10	4/27/96	Breen Creek	37 52.12' 00" / 116 30.03' 00"	1975	PA, SIW	Y	732	1.2	1.78	2.03	731.5	4.6	685,152	GSL	Y
11	4/27/96	Sandeen Spring	37 52.54' 00" / 116 24.62' 00"	2025	PA, S, WM	Y	10.7	3.1	1.5	2	NA	NA	4,895	SCL	Y
12	4/27/96	Thunderbird Spring	37 52.54' 00" / 116 24.62' 00"	2175	PA, S, WM	Y	6.1	3.1	2	2.7	NA	NA	3,721	SCL	Y
13	4/28/96	Monte Christo	37 18.27' 00" / 116 50.1' 00"	1575	S, PA	Y	22.8	1.8	0.1	0.1	22.8	NA	417	SCL	Y
14	4/28/96	South Stonewall Spring	37 29.98' 00" / 117 3.06' 00"	2150	SIW, PA	Y	22.8	18	0.1	0.2	402.3	NA	4,172	RSCL	Y
15	4/28/96	Antelope Spring	37 37.22' 00" / 116 43.62' 00"	1875	S, PA	Y	1	0.6	0.3	0.4	2.44	NA	16.8	SCL	Y
16	4/28/96	Stealth Seep	37 45.40' 00" / 116 50.42' 00"	1889	S, PA	Y	20	5	1.5	1.9	28	NA	15,000	GSCL	Y
17	4/28/96	Cactus Spring, A	37 43.32' 00" / 116 49.05' 00"	1925	S, PA	Y	1.2	0.7	1.7	1.7	NA	NA	142.8	GSL	N
18	4/28/96	Cactus Spring, B	37 43.27' 00" / 116 49.07' 00"	1925	S, PA	Y	5.5	2.5	1.5	1.5	NA	NA	2,063	GSL	Y
19	4/28/96	Cactus Spring, C	37 43.32' 00" / 116 49.05' 00"	1925	S, SSA	Y	0.91	0.9	0.91	0.91	30.5	NA	598	GSL	Y
20	4/28/96	Urania Mine Seep	37 41.86' 00" / 116 49.3' 00"	1608	S, PA	Y	1.5	1.2	0.8	1.1	10.7	NA	146.4	RCL	Y
21	6/26/96	Corral Spring, S	37 47.03' 00" / 116 23' 00"	2050	MTP, PA, SSA	Y	6.4	5	3.68	5.33	NA	0.756	2,683	GSL	Y
22	6/26/96	Corral Spring, N	37 47.21' 00" / 116 23.09' 00"	2050	MTP	Y	3.66	1	0.76	NA	NA	0.01	268	NA	N
23	6/26/96	Sumner Spring	37 46.36' 00" / 116 17.48' 00"	2050	SFBP	Y	14	17	2.03	4.57	NA	75.6	23,800	GSL	Y
24	6/26/96	Rose Spring	37 44.47' 00" / 116 19.53' 00"	2175	SNSF	N	NA	NA	NA	NA	NA	NA	NA	GSL	Y
25	6/26/96	Cedar Pass Spring	37 43.58' 00" / 116 18.38' 00"	2100	PA, SSA	Y	1.22	1.2	0.51	0.51	NA	NA	53	GSL	Y
26	6/26/96	Cedar Spring	37 45.05' 00" / 116 16.44' 00"	2000	W, S	Y	3.7	1.8	0.51	0.51	NA	NA	338	GSL	Y
27	6/26/96	Cedar Wells Complex	37 42.09' 00" / 116 16.40' 00"	2050	S, PA	Y	1.14	0.7	0.3	0.6	NA	NA	23.9	BR	N
28	6/26/96	Cactus Flat Pond	37 44.46' 00" / 116 28.58' 00"	1750	WFBP	Y	90	26	6.1	6.1	NA	75.6	1,427,400	GSL	N
29	6/26/96	Strike Eagle Pond	37 43.04' 00" / 116 43.97' 00"	1725	WFBP	Y	70	29	0.91	0.91	NA	NA	1,847,300	GSL	N
30	6/26/96	TTR Pond	37 46.96' 00" / 116 44.8' 00"	1675	WFBP	Y	34	16	0.91	0.91	NA	NA	495,040	GSL	N
31	6/26/96	Tunnel Spring	37 49.57' 00" / 116 26.42' 00"	1950	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
32	6/26/96	Log Spring	37 45.49' 00" / 116 22.16' 00"	2030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

SS.7

DWP	ESASS	PHI	PHSI	DVE	AVS	WS	HQVR
NA	NA	NA	NA	BS, RB, J, P	PJ	H, C, MC, PJ, RU	D
NA	NA	NA	NA	P, J, GO, MM, BS, RB, PS, CG	PJ	PJ, MC,H	F
NA	NA	NA	NA	NA		NA	NA
NA	NA	NA	NA	NA		NA	NA
NA	NA	NA	NA	NA		NA	NA
NA	NA	CC	NA	NA	SB	PA	D
NA	NA	NA	NA	NA		PF	D
0	22.3	NA	ROL	PS, WR, BS, AW	SAB	ML, C, PA, H, PJ, YRW, MC, GK	C
0	2.1	NA	NA	GO, BS, RB, P, J, PW	PJ	H, MC, LS	C
0	892	SM	NA	BW, RB, PW, BS, PS, TM, RFG, GA, D, C	SAB	YRW, BTS, JR, PA, H, DSL	B
0	185.8	NA	ROL	PW, GA, SR, RFG, DL, WR	PJ	H	A
0	250.8	NA	ROL	PW, GA, SR, RFG, DL, WR	PJ	H	A
0	29	NA	NA	R, SG, SD, BS, FWSB	SAB	AB, H, C, PA, HL, JR, RU	A
NA	81.7	NA	NA	AW, BS, P, WR, DL, D	PJ	GQ, PF, H, CH, WCS, KF, SJ, PJ, NF, AR, HW, YRW, CS, GT	B
NA	3.9	NA	NA	NA	PJ	H, ST, BTS, HF, PA, HL	D
0	26.7	NA	NA	NA		H	F
NA	NA	NA	NA	FC, JT, RB		H, CR, C, LS, HL, PA, CM, CH, BTS, NM, MO, RH, DW, OF, DB	C
0	68.6	NA	NA	JT, RB		H, CR, C, LS, HL, PA, CM, CH, BTS, NM, MO, RH, DW, OF, DB	C
0	397	NA	NA	JT, RB, CE		H, CR, C, LS, HL, PA, CM, CH, BTS, NM, MO, RH, DW, OF, DB	C
0	10.8	NA	NA	FWSB, JT, FC	SB	JR, HF, GC, HL, H	D
0	20	NA	NA	GA, RFG, BC, AM, RB	BB	PA	B
NA	NA	NA	NA	NA	BB	H	D
0	10	NA	NA	CT, TR, BC	PJ	H, PA	A
20.5	1	NA	NA	NA	PJ	PA, MD, BG, DSL, H, MC, C	D
0	25	NA	NA	RFG, SH	PJ	H	C
0	176	NA	NA	NP	SAB	NM	C
NA	NA	NA	NA	NA	PJ	C, H, RT, SO	D
NA	NA	NA	NA	BR, FC, T, SW	SAB	C, YB, HL, RG, MO, PA, RM, RH	A
NA	NA	NA	NA	BR, FC, RW	SAB	C, HL, WWP, HF, AB, KF, GF	A
NA	NA	NA	NA	RO, R, SW	SAB	C, GH0	A
NA	NA	NA	NA	NA	BB	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA

796/052a

CODE DESCRIPTIONS FOR ATTRIBUTES IN GIS TABLE

ATTRIBUTE[1]	CODE[2]	DESCRIPTION
Water Resources Types (WR):	MMP	– Man-made pond
	MTP	– Metal trough from pipe
	PA	– Pooled area
	S	– Seep
	SFBP	– Spring-fed bermed pond
	SIW	– Seep with intermittent watercourse
	SNSF	– Spring, no surface flow
	SSA	– Saturated soil area
	W	– Well
	WFBP	– Water-filled bermed pond
	WM	– Wet meadow
Inundation Present (IP):	Y	– Yes; N – No
Overall Length (OL):	(meters)	
Overall Width (OW):	(meters)	
Average Depth (AD):	(decimeters)	
Depth Range (DR):	(decimeters)	
Source-to-Sink Distance (SSD):	(meters)	
Estimated Flow-Volume (EFV):	(liters per minute)	
Est. Volume of Standing Water (EVSW):	(liters)	
Substrate Type (ST):	BR	– Bedrock
	GSCL	– Gravelly sandy clay loam
	GSL	– Gravelly sandy loam
	RA	– Rocky alluvium
	RCL	– Rocky clay loam
	RGSL	– Rocky sandy gravelly loam
	RSCL	– Rocky sandy clay loam
	SCL	– Silt clay loam
	SSCL	– Sandy silt clay loam
Saturated Soil Present (SSP):	Y	– Yes; N – No
Depth to Water In Pit (DWP):	(centimeters below soil surface)	
Est. Surface Area of Saturated Soils (ESASS):	(meters^2)	
Presence of Hydrologic Indicators (PHI):	CC	– Cracked clay
	D	– Debris
	HRZ	– Hydrophyte root zones
	SM	– Scour marks
	WM	– Water marks
Presence of Hydric Soil Indicators (PHSI):	OIM	– Oxidized iron mottles
	ROL	– Reduced organic layers

ATTRIBUTE[1]	CODE[2]	DESCRIPTION
Dominant Vegetation Elements (DVE):	AM	– Prostrate Amaranth *(Amaranthus blitoides)*
	AW	– Arroyo Willow *(Salix lasiolepis)*
	BC	– Desert Buttercup *(Ranunculus cymbalaria saximontanus)*
	BR	– Bulrush *(Scirpus validus)*
	BS	– Big Sagebrush *(Artemesia tridentata)*
	BW	– Black Willow *(Salix gooddingii)*
	C	– Clover *(Trifolium monanthum monanthum)*
	CE	– Chinese Elm *(Ulmus parviflora)*
	CG	– Cheat-grass *(Bromus tectorum)*
	CT	– Cat-tail *(Typha domingensis/T. latifolia)*
	D	– Dock *(Rumex crispus)*
	DL	– Dandelion *(Taraxacum officinale)*
	FC	– Fremont Cottonwood *(Populus fremontii)*
	FWSB	– Four-winged Saltbush *(Atriplex canescens canescens)*
	GA	– Green Algae *(Chlorophyta-nonspecific identity)*
	GO	– Gambel Oak *(Quercus gambelii)*
	J	– Juniper *(Juniperus osteosperma)*
	JT	– Joshua Tree *(Yucca brevifolia)*
	MM	– Mountain Mahogany *(Cercocarpus ledifolius)*
	NP	– Nitrophila *(Nitrophila occidentalis)*
	P	– Pinyon *(Pinus monophylla)*
	PS	– Penstemon *(Penstemon-nonspecific identity)*
	PW	– Pondweed *(Potamogeton pectinatus)*
	R	– Rush *(Juncus balticus, J. nodosus, J. ensifolius montanus)*
	RB	– Rabbitbrush *(Chrysothamnus viscidiflorus stenophyllus; C. nauseosus,*
	RFG	– Rabbit's-foot Grass *(Polypogon monspeliensis)*
	RO	– Russian-Olive *(Elaeagnus angustifolia)*
	RW	– Western Ragweed *(Ambrosia psilostachya)*
	SC	– Sweet Clover *(Melilotus indicus)*
	SD	– Sand Dropseed *(Sporobolus cryptandrus)*
	SG	– Saltgrass *(Distichlis spicata)*
	SH	– Salt Heliotrope *(Heliotropium curassavicum)*
	SR	– Spike Rush *(Eleocharis macrostachya)*
	SW	– Slender Willow *(Salix exigua)*
	T	– Tamarisk *(Tamarix ramosissima)*
	TM	– Tansy Mustard *(Descurainia pinnata glabra)*
	TR	– Toad Rush *(Juncus bufonius)*
	WR	– Wild Rose *(Rosa woodsii)*
Adjacent Vegetation Series (AVS):	BB	– Blackbrush
	CB	– Creosote Bursage
	PJ	– Pinyon Juniper
	SAB	– Sagebrush
	SB	– Saltbush

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CODE DESCRIPTIONS FOR ATTRIBUTES IN GIS TABLE (cont.)

ATTRIBUTE[1]	CODE[2]	DESCRIPTION	CODE[2]	DESCRIPTION
Wildlife sign: (WS):	AB	– American Badger *(Taxidea taxus)*	MO	– Mourning Dove *(Zenaida macroura)*
	AR	– American Robin *(Turdus migratorius)*	MD	– Mule Deer *(Odocoileus hemionus)*
	BG	– Black-throated Gray Warbler *(Dendroica nigrescens)*	ML	– Mountain Lion *(Felis concolor)*
	BTS	– Black-throated Sparrow *(Amphispiza bilineata)*	MW	– Marsh Wren *(Cistothorus palustris)*
	C	– Coyote *(Canus latrans)*	NF	– Northern Flicker *(Colaptes auratus)*
	CH	– Chukar *(Alectoris chukar)*	NM	– Northern Mockingbird *(Mimus polyglottos)*
	CM	– California Myotis Bat *(Myotis californicus)*	OF	– Olive-sided Flycatcher *(Contopus borealis)*
	CO	– Mountain Cottontail *(Sylvilagus nuttalli)*	PA	– Pronghorn Antelope *(Antilocapra americana)*
	CR	– Common Raven *(Corvus corax)*	PF	– Prairie Falcon *(Falco mexicanus)*
	CS	– Chipping Sparrow *(Spizella passerina)*	RH	– Red-tailed Hawk *(Buteo jamaicensis)*
	DB	– Desert Bighorn Sheep *(Ovis canadensis)*	RM	– Red-breasted Merganser *(Mergus serrator)*
	DSL	– Desert Spiny Lizard *(Sceloporus magister)*	PJ	– Pinyon Jay *(Gymnorhinus cyanocephalus)*
	DW	– Desert Woodrat *(Neotoma lepida)*	RC	– Raccoon *(Procyon lotor)*
	GF	– Goldfish *(Carassius auratus)*	RT	– Rufous-sided Towhee *(Pipilo erythrophthalmus)*
	KF	– Kit-Fox *(Vulpes macrotis nevadensis)*	RU	– Raptors *(unspecified identities)*
	GHO	– Great Horned Owl *(Bubo virginianus)*	SO	– Scott's Oriole *(Icterus parisorum)*
	GK	– Golden-crowned Kinglet *(Regulus satrapa)*	SJ	– Scrub Jay *(Aphelocoma coerulescens)*
	GQ	– Gambel's Quail *(Callipepla gambilii)*	ST	– Sage Thrasher *(Oreoscoptes montanus)*
	GT	– Green-tailed Towhee *(Pipilo chlororus)*	T	– Turkey *(Meleagris gallopavo)*
	H	– Horse *(Equus caballus)*	WCS	– White-crowned Sparrow *(Zonotrichia leucophrys)*
	HF	– House Finch *(Carpodacus mexicanus)*	WWP	– Western Wood-pewee *(Contopus sordidulus)*
	HL	– Horned Lark *(Eremophila alpestris)*	YB	– Yellow-headed Blackbird *(Xanthocephalus xanthocephalus)*
	HW	– House Wren *(Troglodytes aedon)*	YRW	– Yellow-rumped Warbler *(Dendroica coronata)*
	JR	– Jackrabbit *(Lepus californicus)*		
	LS	– Lark Sparrow *(Chondestes grammacus)*		
	MC	– Mountain Chickadee *(Parus gambeli)*		
Habitat Quality Value Rating (HQVR):	A, B, C, D, F (scholastic letter-grade equivalent)			

[1] See Appendix A for detailed explanations about how attributes were recorded onto field survey dataforms.

[2] The code "NA" (not applicable) is entered in the GIS database table whenever an attribute was not present or not measurable at a given site.

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APPENDIX G.3

NEVADA BLM SENSITIVE SPECIES LIST

Species designated by the State Director, in cooperation with the State of Nevada Department of Conservation and Natural Resources, that are not already included as BLM Special Status Species under (1) federally listed, proposed, or candidate species; or (2) species listed by the State of Nevada because of potential endangered or extinction. BLM policy is to provide these species with the same level of protection as is provided for candidate species under BLM Manual 6840.06 D.

Scientific Name	*Common Name*
Mammals	
Eumops perotis californicus	Greater western mastiff bat
Idionycteris phyllotis (=Plecotus p.)	Allen's big-eared bat
Macrotus californicus	California leaf-nosed bat
Microtus montanus fucosus	Pahranagat Valley montane vole
Microtus montanus nevadensis	Ash Meadows montane vole
Myotis ciliolabrum	Small-footed myotis
Myotis evotis	Long-eared myotis
Myotis thysanodes	Fringed myotis
Myotis velifer	Cave myotis
Myotisvolans	Long-legged myotis
Myotis yumanensis	Yuma myotis
Nyctinomops macrotis (=Tadarida m., T. molossa)	Big free-tailed bat
Plecotus townsendii pallescens	Pale Townsend's big-eared bat
Plecotus townsendii townsendii	Pacific Townsend's big-eared bat
Sorex preblei	Preble's shrew
Thomomys umbrinus abstrusus	Fish Spring pocket gopher
Thomomys umbrinus curtatus	San Antonio pocket gopher
Birds	
Chlidonias niger	Black tern
Charadrius alexandrinus nivosus	Western snowy plover
Centrocercus urophasianus	Western sage grouse
Oreortyx pictus	Mountain quail
Phainopepla nitens	Phainopepla
Reptiles	
Sauromalus obesus	Chuckwalla
Amphibians	
Bufo microscaphus microscaphus	Arizona toad
Bufo nelsoni	Amargosa toad
Fish	
Catostomus latipinnis	Flannelmouth sucker
Catostomus sp.	Wall Canyon sucker
Crenichthys baileyi thermophilus	Moorman White River springfish
Gila bicolor spp.	Hot Creek Valley tui chub
Gila bicolor isolata	Independence Valley tui chub
Lepidomeda mollispinis mollispinis	Virgin River spinedace
Oncorhynchus clarki utah	Bonneville cutthroat trout
Oncorhynchus mykiss gibbsi	Interior redband trut

Rhinichthys osculus ssp.	Meadow Valley Wash speckled dace
Rhinichthys osculus ssp.	Oasis Valley speckled dace
Snails	
Fluminicola merriami	Pahranagat pebblesnail
Oreohelix nevadensis	Schell Creek mountainsnail
Pyrgulopsis micrococcus	Oasis Valley springsnail
Pyrgulopsis wongi	Wong's springsnail
Pyrgulopsis sp.	Red Rocks springsnail #1
Pyrgulopsis sp.	Red Rocks springsnail #2
Tryonia clathrata	Grated tryonia
Clams & Mussels	
Anodonta californiensis	California floater
True Bugs	
Pelocoris shoshone shoshone	Pahranagat naucorid bug
Beetles	
Aegialia crescenta	Crescent Dune aegialian scarab
Aegialia hardyi	Hardy's aegialian scarab
Aegialia magnifica	Large aegialian scarab
Aphodius sp.	Big Dune aphodius scarab
Aphodius sp.	Crescent Dune aphodius scarab
Aphodius sp.	Sand Mountain aphodius scarab
Miloderes sp.	Rulien's miloderes weevil
Pseudocotalpa giulianii	Giuliani's dune scarab
Serica sp.	Crescent Dune serican scarab
Serica sp.	Sand Mountain serican scarab
Stenelmis calida calida	Devil's Hole warm spring riffle beetle
Stenelmis calida moapa	Moapa warm springs riffle beetle
Butterflies and Moths	
Cercyonis pegala carsonensis	Carson Valley wood nymph
Cercyonis pegala ssp.	White River wood nymph
Chlosyne acastus	Spring Mountains acastus checkerspot
Euphilotes battoides ssp.	Baking Powder Flat blue
Euphilotes enoptes ssp.	Spring Mountains dark blue
Euphilotes palliscens ssp.	Sand Mountain blue
Euphydryas editha monoensis	Mono checkerspot
Hesperia comma ssp.	Spring Mountains comma skipper
Hesperia uncas ssp.	Railroad Valley skipper
Hesperopsis gracielae	MacNeill sooty wing skipper
Icaricia icarioides	Spring Mountains icarioides blue
Limenitis archippus lahontani	Nevada viceroy
Limenitis weidemeyerii nevadae	Nevada admiral
Phyiodes pascoensis ssp.	Steptoe Valley crescentspot
Polites sabuleti sinemaculata	Denio sandill skipper
Speyeria atlantis greyi	Grey's silverspot
Speyeria nokomis ssp.	Carson Valley silverspot
Plants	
Angelica scabrida	Rough angelica
Antennaria arcuata	Meadow pussytoes
Arabis bodiensis	Bodie Hills rockcress
Arabis falcatoria	Grouse Creek rockcress

Arabis falcifructa	Elko rockcress
Arabis ophira	Ophir rockcress
Arctomecon merriamii	White bearpoppy; Merriam b.
Asclepias eastwoodiana	Eastwood milkweed
Astragalus aequalis	Clokey milkvetch; equal m.
Astragalus amphioxys var. mucimonum	Sheep Mountain milkvetch; crescent m.
Astragalus anserinus	Goose Creek milkvetch
Plants	
Astragalus eurylobus	Needle Mountains milkvetch; Peck Station m.
Astragalus funereus	Black woollypod; Funeral milkvetch; black m; Rhyolite m.
Astragalus gilmanii	Gilman milkvetch
Astragalus inyoensis	Inyo milkvetch
Astragalus mokiacensis	Mokiak milkvetch
Astragalus oophorus var. lavinii	Lavin eggvetch
Astragalus remotus	Spring Mountain milkvetch
Astragalus robbinsii var. occidentalis	Lamoille Canyon milkvetch; Ruby m.; Robbin's western m.
Astragalus solitarius	Lonesome milkvetch; weak m.
Astragalus tiehmii	Tiehm milkvetch
Astragalus toquimanus	Toquima milkvetch
Astragalus uncialis	Currant milkvetch
Botrychium crenulatum	Dainty moonwort; scalloped m.; crenulate m.
Calochortus striatus	Alkali mariposa lily; striped m. l.
Camissonia megalantha	Cane Spring evening-primrose; C.S. suncup
Chrysothamnus eremobius	Remote rabbitbrush; Pintwater r.
Collomia renacta	Barren Valley collomia
Cordylantus tecopensis	Tecopa birdsbeak
Cryptantha schoolcraftii	Schoolcraft catseye
Cryptantha welshii	White River catseye; Welsh c.
Cusickiella quadricostata	Bodie Hills draba; four-rib whitlowgrass
Cymopterus goodrichii	Goodrich biscuitroot; G. parsley
Cymopterus ripleyi var. saniculoides	Sanicle biscuitroot; Ripley b.
Didymodon nevadensis	Gold Butte moss
Enceliopsis argophylla	Silverlead sunray
Epilobium nevadense	Nevada willowherb
Erigeron latus	Broad fleabane
Erigeron ovinus	Sheep fleabane
Eriogonum anemophilus	Windloving buckwheat
Eriogonum bifurcatum	Pahrump Valley buckwheat; forked b.
Eriogonum corymbosum var. aureum	Golden buckwheat
Eriogonum crosbyae	Crosby buckwheat
Eriogonum heermannii var. clokeyi	Clokey buckwheat
Eriogonum lewisii	Lewis buckwheat
Eriogonum prociduum	Prostrate buckwheat; Austin b.
Eriogonum robustum	Altered andesite buckwheat
Eriogonum tiehmii	Tiehm buckwheat
Frasera pahutensis	Pahute green gentian; P. elkweed
Galium hilendiae ssp. *kingstonense*	Kingston Mountains bedstraw
Glossopetalon pungens var. glabra	Smooth dwarf greasebush
Glossopetalon pungens var. pungens	Dwarf greasebush
Haplopappus graniticus	Long Mountain tonestus
Ionactis caelestis	Red Rock Canyon aster

Ivesia aperta var. aperta	Sierra Valley ivesia
Ivesia arizonica var. saxosa	Rock purpusia
Ivesia jaegeri	Jaeger ivesia
Ivesia pityocharis	Pine Nut Mountains ivesia; P.N.M. mousetails
Ivesia rhypara var. rhypara	Grimy ivesia
Ivesia webberi	Webber ivesia
Jamesia tetrapetala	Waxflower
Lathyrus grimesii	Grimes vetchling
Leptodactylon glabrum	Bruneau River prickly phlox; Owyhee p.p.
Lomatium graveolens var. clarkii	Clark parsley; Zion p.
Lupinus holmgrenanus	Holmgren lupine
Mentzelia mollis	Smooth stickleaf
Mentzelia packardiae	Packard stickleaf
Oryctes nevadensis	Oryctes
Penstemon albomarginatus	White-margined beardtongue
Penstemon arenarius	Nevada dune beardtongue
Penstemon bicolor spp. *Bicolor*	Yellow twotone beardtongue
Penstemon concinnus	Tunnel Springs beardtongue
Penstemon floribundus	Cordelia beardtongue
Penstemon fruitciformis ssp. *amargosae*	Death Valley beardtongue; Amargosa bush penstemon
Penstemon pahutensis	Pahute Mesa beardtongue
Penstemon pudicus	Bashful beardtongue
Phacelia beatleyae	Beatley scorpion plant
Phacelia minutissima	Lease phacelia; dwarf p.
Phacelia monoensis	Mono County phacelia
Phacelia parishii	Parish phacelia; playa p.
Pinus washoensis	Washoe pine
Polyctenium fremontii var. confertum	Crowded combleaf
Prophyllum pygmaeum	Pygmy poreleaf
Potentilla basaltica	Soldier Meadows cinquefoil; basalt c.; purple potentilla
Potentilla cottamii	Cottam cinquefoil
Salvia dorrii var. clokeyi	Clokey mountain sage; C. purple s.
Sclerocactus blainei	Blaine pincushion; B. fishhook cactus
Sclerocactus nyensis	Tonopah fishhook cactus
Sclerocactus schlesseri	Schlesser pincushion; S. fishhook cactus
Silene nachlingerae	Nachlinger catchfly; N. campion
Sphaeralcea caespitosa	Jones globemallow
Streptanthus oliganthus	Mason Mountain jewelflower; M.M. twistflower
Stroganowia tiehmii	Tiehm stroganowia
Townsendie jonesii var. tumulosa	Charleston grounddaisy
Trifolium andinum var. podocephalum	Currant Summit clover
Trifolium leibergii	Leiberg clover
Viola lithion	Rock violet

The species of animals listed below were not included on the recently approved (4/97) Nevada BLM Sensitive Species List because they are "protected" under the State of Nevada Administrative Codes (NAC), and would (it was assumed) therefore be included automatically as BLM Special Status Species under BLM's policy (6840 Manual) of being "listed or proposed for listing by a State in a category implying potential endangerement or extinction." However, the way in which NAC categorizes "protected" animal species does not fit well with the BLM's definition. For example, NAC 503.050 species all species of nongame birds "protected by provisions of federal law" as "protected' under NAC. Thus, all birds protected by the Migratory Bird Treaty Act (includes almost every native bird species in North America) would be BLM Special Status Species because they are "protected" by the State of Nevada. For other "protected" animal groups, i.e., fishes, the NAC include further categories of "sensitive," "threatened," and "endangered," which would unquestionably fit the BLM's definition. Therefore, to eliminate confusion and to ensure that only State-"protected" animal species which fit within the BLM's policy (Manual) definition are included as BLM Special Status Species, the following "protected" animal species listed in the NAC are proposed to be added to the BLM Nevada Sensitive Species List.

Please review the following list of proposed species additions (several species of birds from the Partners in Flight priority management list have been added to the previous proposed list) to the BLM Sensitive Species List for Nevada, and send comments by Friday, January 23, to Randy McNatt at the BLM State Office via GroupWise or at 702/785-6473.

Proposed Additions to Nevada BLM/s Sensitive Species List	
Mammals	
Euderma maculatum	Spotted bat
Birds	
Accipiter gentilia	Goshawk
Aquila chrysaetos	Golden eagle
Asio flammeus	Short-eared owl
Asyndesmus lewis	Lewis' woodpecker
Buteo regalis	Ferruginous hawk
Buteo swainsoni	Swainson's hawk
Coccyzus americanus	Yellow-billed cuckoo
Dendroica petechia	Yellow warbler
Dolichonys oryzivorus	Bobolink
Empidonax trailli	Willow flycatcher
Geothlypis trichas	Yellowthroat
Icteria virens	Yellow-breasted chat
Numenius americanus	Long-billed curlew
Opororis tolmiei	MacGillivray's warbler
Otus flammeolus	Flammulated owl
Pandion haliaetus	Osprey
Pelecanus erythrorhynchos	White pelican
Phainopepla nitens	Phainopepla
Speotyto cunicularia	Burrowing owl
Vermivora celata	Orange-crowned warbler
Vireo bellii	Bell's vireo
Vireo vicinoir	Gray vireo
Wilsonia pusilla	Wilson's warbler

Reptiles	
Heloderma suspectum	Gila monster
Fish	
Catostomus clarki intermedius	White River desert sucker
Catostomus clarki ssp.	Meadow Valley Wash desert sucker
Fish	
Crenichthys baileyi albivallis	Preston White River springfish
Gila bicolor euchila	Fish Creek Springs tui chub
Gila bicolor newarkensis	Newark Valley tui chub
Gila bicolor ssp.	Big Smoky Valley tui chub
Gila bicolor ssp.	Fish Lake Valley tui chub
Gila bicolor ssp.	Railroad Valley tui chub
Gila robusta seminuda (Moapa River population only)	Virgin River roundtail chub
Lepidomeda mollispinis mollispinis	Virgin River spinedace
Relictus solitarius	Relict dace
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace
Rhinichthys osculus moapae	Moapa speckled dace
Rhinichthys osculus velifer	White River speckled dace
Rhinichthys osculus ssp.	Monitor Valley speckled dace

APPROVED BY

Ann J. Morgan
State Director, Nevada
Bureau of Land Management

3-31-97
Date

Peter G. Morros, Director
Nevada Department of Conservation and
Natural Resources

4-3-97
Date

Appendix H
MINORITY AND LOW-INCOME POPULATION DATA

Table H-1. Minority and Low-Income Populations by Census Tract/Block Numbering Area (BNA)
(page 1 of 3)

	County	*Percent Minority*	*Disproportionately High* [a]	*Percent Low-Income* [b]	*Disproportionately High* [a]
ROI [c]	NA	24.1	---	10.4	---
Clark County	NA	24.5	---	10.3	---
Lincoln County	NA	8.2	---	13.1	---
Nye County	NA	12.0	---	10.3	---
Census Tracts/BNAs					
000101	Clark	22.8		8.7	
000102	Clark	18.6		11.1	Yes
000103	Clark	15.4		9.0	
000104	Clark	14.7		7.8	
000105	Clark	14.1		5.7	
000201	Clark	70.7	Yes	17.8	Yes
000202	Clark	22.3		9.5	
000301	Clark	90.3	Yes	33.3	Yes
000302	Clark	94.3	Yes	52.1	Yes
0004	Clark	49.4	Yes	25.1	Yes
000502	Clark	47.2	Yes	16.0	Yes
000503	Clark	50.9	Yes	24.4	Yes
000504	Clark	64.3	Yes	33.9	Yes
000506	Clark	26.2	Yes	6.6	
000507	Clark	31.9	Yes	10.3	
000508	Clark	33.5	Yes	5.2	
000509	Clark	29.4	Yes	9.2	
0006	Clark	29.7	Yes	19.0	Yes
0007	Clark	37.9	Yes	18.0	Yes
0008	Clark	28.3	Yes	19.2	Yes
0009	Clark	36.4	Yes	18.3	Yes
001097	Clark	13.2		6.3	
001098	Clark	10.7		4.1	
0011	Clark	62.1	Yes	28.1	Yes
0012	Clark	23.5		8.6	
0013	Clark	23.7		11.5	Yes
0014	Clark	22.9		7.7	
0015	Clark	15.4		11.9	Yes
001602	Clark	27.1	Yes	8.6	
001603	Clark	22.9		7.8	
001604	Clark	15.6		8.6	
001701	Clark	17.2		8.6	
001702	Clark	12.1		9.5	
001703	Clark	12.7		5.0	
001704	Clark	13.4		3.5	
001705	Clark	18.1		6.7	
001801	Clark	12.0		6.2	
001802	Clark	19.3		6.5	
0019	Clark	29.4	Yes	11.3	Yes
0020	Clark	19.3		12.7	Yes
002201	Clark	18.5		11.4	Yes
002202	Clark	29.0	Yes	13.1	Yes

Table H-1. Minority and Low-Income Populations by Census Tract/BNA
(page 2 of 3)

	County	*Percent Minority*	*Disproportionately High* [a]	*Percent Low-Income* [b]	*Disproportionately High* [a]
0023	Clark	20.7		17.7	Yes
002401	Clark	28.1	Yes	18.6	Yes
002402	Clark	36.2	Yes	15.0	Yes
002501	Clark	15.7		10.6	Yes
002502	Clark	23.2		14.8	Yes
0026	Clark	22.0		13.9	Yes
002701	Clark	20.4		11.4	Yes
002702	Clark	22.3		9.2	
002803	Clark	13.0		3.5	
002804	Clark	10.0		4.9	
002805	Clark	13.9		5.0	
002806	Clark	16.2		6.9	
002905	Clark	13.4		4.5	
002906	Clark	13.0		3.4	
002907	Clark	13.0		4.4	
002908	Clark	19.7		1.1	
002909	Clark	14.2		1.0	
002910	Clark	14.2		3.3	
002911	Clark	15.9		3.1	
002912	Clark	18.1		8.5	
002913	Clark	23.2		12.0	Yes
002914	Clark	13.4		7.7	
003001	Clark	12.7		5.9	
003002	Clark	14.6		3.8	
0031	Clark	16.7		4.6	
003201	Clark	7.2		3.6	
003202	Clark	11.1		2.9	
0033	Clark	8.9		4.7	
003401	Clark	39.3	Yes	18.1	Yes
003403	Clark	12.4		4.2	
003404	Clark	13.1		3.7	
003405	Clark	16.4		4.1	
003406	Clark	17.1		6.5	
003407	Clark	16.6		6.6	
0035	Clark	93.2	Yes	39.9	Yes
003601	Clark	22.6		7.8	
003602	Clark	96.4	Yes	39.9	Yes
0037	Clark	97.4	Yes	15.1	Yes
0038	Clark	75.0	Yes	31.1	Yes
003997	Clark	45.9	Yes	7.4	
003998	Clark	41.7	Yes	34.1	Yes
0040	Clark	44.9	Yes	12.5	Yes
0041	Clark	32.4	Yes	9.7	
0042	Clark	48.5	Yes	18.1	Yes
0043	Clark	65.2	Yes	24.3	Yes
0044	Clark	65.8	Yes	21.6	Yes
0045	Clark	58.6	Yes	9.5	

Table H-1. Minority and Low-Income Populations by Census Tract/BNA
(page 3 of 3)

	County	*Percent Minority*	*Disproportionately High* [a]	*Percent Low-Income* [b]	*Disproportionately High* [a]
0046	Clark	66.0	Yes	28.4	Yes
004702	Clark	27.8	Yes	15.8	Yes
004703	Clark	41.1	Yes	12.0	Yes
004704	Clark	42.4	Yes	12.0	Yes
004705	Clark	38.1	Yes	17.8	Yes
004706	Clark	21.1		10.6	Yes
004897	Clark	12.4		9.3	
004898	Clark	28.1	Yes	7.8	
004901	Clark	18.4		7.3	
004902	Clark	24.6	Yes	6.8	
004903	Clark	23.1		3.6	
005001	Clark	12.2		9.1	
005002	Clark	20.5		8.1	
0051	Clark	11.8		4.4	
0052	Clark	14.5		11.6	Yes
005301	Clark	13.1		2.2	
005302	Clark	8.6		4.5	
005401	Clark	17.7		10.8	Yes
005402	Clark	18.8		14.7	Yes
005403	Clark	9.2		6.1	
005501	Clark	4.8		7.8	
005502	Clark	5.2		3.7	
005503	Clark	6.9		10.1	
005504	Clark	6.1		4.6	
005601	Clark	20.1		7.4	
005602	Clark	9.8		9.7	
005603	Clark	13.8		11.1	Yes
0057	Clark	12.7		10.3	
005897	Clark	14.4		5.7	
005898	Clark	20.8		6.7	
0059	Clark	46.6	Yes	18.6	Yes
9501	Lincoln	8.6		9.1	
9502	Lincoln	6.9		0.0	
9503	Lincoln	6.2		16.4	Yes
9504	Lincoln	9.3		17.1	Yes
9801	Nye	18.2		5.9	
9802	Nye	10.5		9.0	
9803	Nye	11.3		16.3	Yes
9804	Nye	8.1		11.8	Yes
9805	Nye	29.5	Yes	4.7	

Notes: (a) A census tract/Block Numbering Area (BNA) is deemed to have a disproportionately high percentage of persons in minority populations and/or low-income populations if the census tract percentage is higher than the percentage in the ROI or if the minority percentage is greater than 50 percent.

(b) Low-income is measured by identifying the number of persons below poverty level ($12,764 for a family of four in 1989, as reported in the 1990 Census of Population and Housing).

(c) The ROI is comprised of three counties: Clark, Lincoln, and Nye counties in Nevada.

Source: SAIC 1997; U.S. Department of Commerce 1991 and 1992.

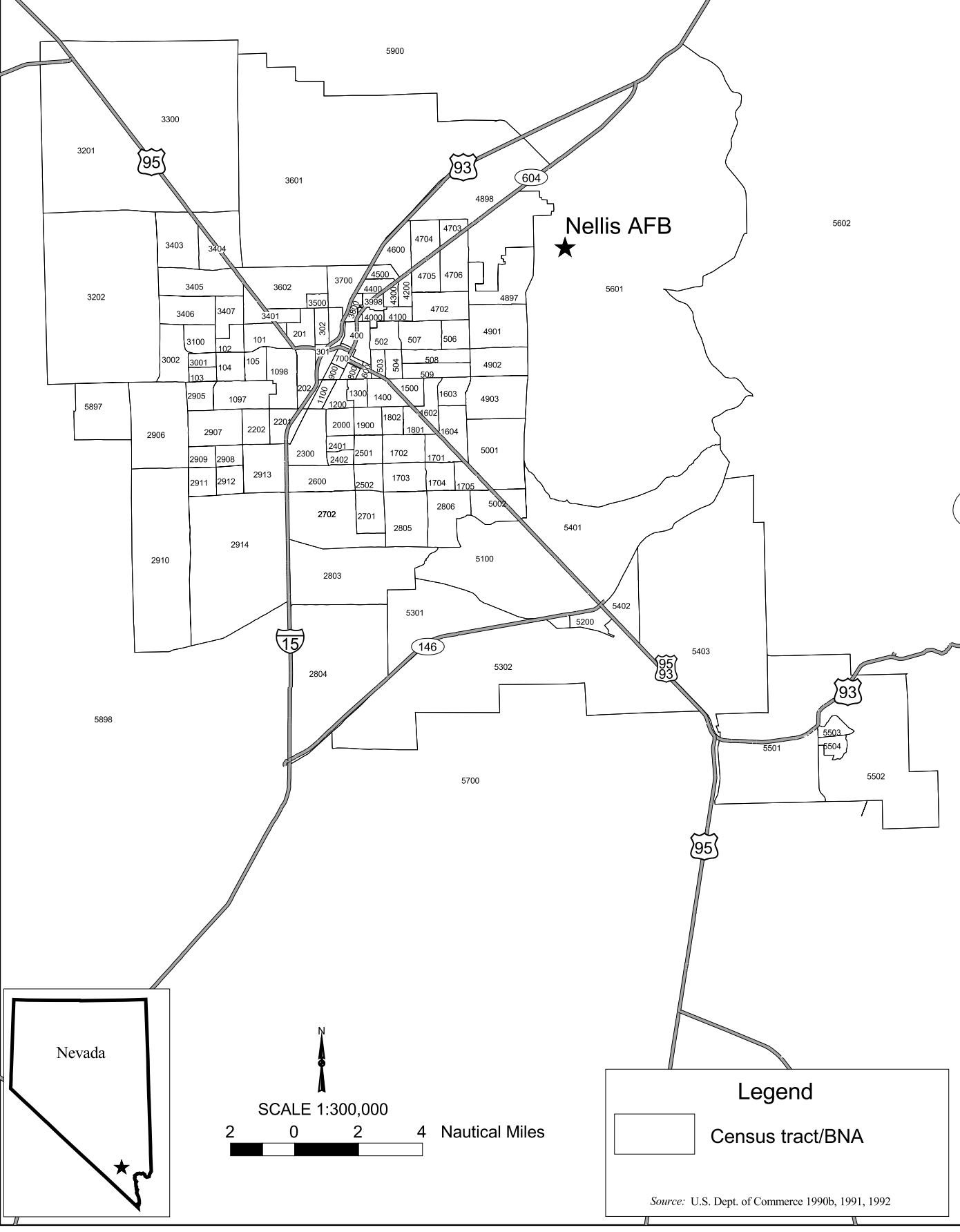


Figure H-1. Census Tract/BNAs in Clark, Lincoln, and Nye Counties (detail) (see also Figure 3.13-2)

Appendix I
AIR QUALITY DATA ASSOCIATED WITH OPERATION AND MAINTENANCE OF NELLIS AIR FORCE RANGE

ESTIMATED ANNUAL AVERAGE EMISSIONS ASSOCIATED WITH OPERATION AND MAINTENANCE OF NELLIS AIR FORCE RANGE

Table 1. Emissions Source Data

Emissions Source (a)	Annual Fuel Use		Hours Per Year	Miles Per Year
	Gasoline (Gals)	Diesel (Gals)		
Generators:				
≤ 15 KW	17,180	38,516	35,088	NA
> 15 KW	NA	478,033	129,267	NA
Steam	NA	412,000	ND	NA
Vehicles:				
≤ 1 ton	1,156,792	73,838	NA	12,306,300
> 1 ton	94,361	283,083	NA	3,272,440

Notes:

(a) Data covers Air Force, DOE, and contractor personnel ground activities, acres, targets, and roads used during tthe operations and maintenanace of the Nellis Air Force Range (see Appendix A.6).

NA = Not applicable.
ND = No data.

Table 2. Combustion Emission Factors for Sources Associated with Operation and Maintenance of the Nellis Air Force Range

Emissions Source	Fuel Type	Emission Factors							Source
		TOG	VOC	CO	NOx	SO2	PM	PM10	
Generators:		(Pounds per 1,000 Gallons)							
≤ 15 KW	Gasoline	275.8	266.9	7,967.8	207.1	10.7	12.7	12.5	(a)
≤ 15 KW	Diesel	57.6	48.0	130.2	604.3	39.7	42.5	41.6	(b)
> 15 KW	Diesel	57.6	48.0	130.2	604.3	39.7	42.5	41.6	(b)
Steam	Diesel	2.3	2.2	6.6	95.6	14.2	8.4	4.0	(c)
Vehicles:		(Grams per Mile)							
≤ 1 ton	Gasoline	NC	3.78	27.90	1.90	NC	NC	NC	(d)
≤ 1 ton	Diesel	NC	0.81	1.22	1.64	NC	NC	NC	(d)
> 1 ton	Gasoline	NC	8.99	75.47	5.93	NC	NC	NC	(d)
> 1 ton	Diesel	NC	2.14	9.59	13.40	NC	NC	NC	(d)

Notes:

(a) From AP-42, Table 3.3-1, Vol. I (EPA 1993). Based on gasoline fuel with heating value of 20,300 Btu/lb, density of 6.26 lb/gal, and sulfur content of 0.2 percent.

(b) From AP-42, Table 3.3-1, Vol. I (EPA 1993). Based on diesel fuel with heating value of 19,300 Btu/lb, density of 7.1 lb/gal, and sulfur content of 0.2 percent.

(c) From AP-42, Table 3.1-1, Vol. I (EPA 1993). Based on diesel fuel with heating value of 19,300 Btu/lb, density of 7.1 lb/gal, and sulfur content of 0.2 percent.

(d) Emission factors are from MOBILE5 Mobile Source Emission Model, released March 26, 1993, based on an average vehicle speed of 25 miles per hour. Combustion emissions of SO2 and particulate matter are not calculated by the model (indicated by "NC"), and are assumed to be negligible.

≤ = Less than or equal to.
> = Greater than.
NC = Not calculated.

Table 3. Fugitive Dust Emission Factors for Sources Associated with Operation and Maintenance of the Nellis Air Force Range

Emissions Source	Average Speed (mph)	Ave. Vehicle Weight (tons)	Ave. Number of Wheels	PM10 Emission Factor (Pounds per VMT)	
				Unpaved Road (a)	Paved Road (b)
Vehicles:					
≤ 1 ton	25	0.75	4	0.59	0.018
> 1 ton	25	5	6	2.72	0.018

Notes:

(a) Based on equation 1 in section 11.2.1 of AP-42 (EPA 1993). Silt content of road surface material = 12 percent, and number of days with at least 0.01 inch of precipitation = 45.

(b) Paved road factor obtained from section 11.2.5 of AP-42 (EPA 1993).

Table 4. Emissions From Sources Associated with Operation and Maintenance of the Nellis Air Force Range

Emissions Source	Source Type	Emissions (tons per year)				
		VOC	CO	NOx	SO2	PM10
Generators:						
≤ 15 KW	Gasoline	2.3	68.4	1.8	0.1	0.1
≤ 15 KW	Diesel	0.9	2.5	11.6	0.8	0.8
> 15 KW	Diesel	11.5	31.1	144.4	9.5	10.0
Steam	Diesel	0.5	1.4	19.7	2.9	0.8
Vehicles:						
≤ 1 ton	Gasoline	48.2	355.8	24.2	--	--
≤ 1 ton	Diesel	0.7	1.0	1.3	--	--
> 1 ton	Gasoline	8.1	68.1	5.3	--	--
> 1 ton	Diesel	5.8	25.9	36.3	--	--
Vehicles:						
≤ 1 ton	Road Dust	--	--	--	--	2,741.3
> 1 ton	Road Dust	--	--	--	--	3,342.2
	TOTAL	77.9	554.2	244.7	13.3	6,083.5

Appendix J
DROPPED OBJECTS DOCUMENT

Appendix J

Dropped Objects

1.0 OBJECT BEHAVIOR

While infrequent, it is possible that objects may separate from an aircraft in flight. If this occurs, there is some risk to persons and property on the ground of being struck by the object. The discussion below addresses a means to assess this risk and presents a hypothetical situation as an example to quantify this risk. The scenario described is purely hypothetical and does not reflect any actual documented events. To perform the mathematical calculations supporting this assessment, certain assumptions must be made about the physical properties of the dropped object, and about the probability of such an event even occurring. The assumptions specified are conservative and do not reflect any actual statistical data about dropped objects.

1.1 Introduction

If an object separates from an aircraft in flight, there are numerous physical factors that act on the object that influence where, and with what force, the object impacts the ground. These factors include the size, shape, and weight of the object, as well as other aerodynamic forces that act on the object as it falls through the air. All of these interrelated factors determine the ballistic flight path of the object. These factors are discussed in more detail below.

1.2 Ballistic Trajectory

For this discussion, three components of the object's flight path are considered in describing its ballistic trajectory. By isolating each of the components, approximations can be made of where and with what force the object could be expected to strike the ground. The three components that will first be isolated, and then integrated, are the vertical, horizontal, and lateral components.

1.2.1 VERTICAL COMPONENT

When an object is dropped, it is subjected to the force of gravity, and enters free-fall toward the ground. The force of gravity, alone, is a force that creates an acceleration of approximately 32.2 feet/second^2. However, acceleration is not constant. The object's shape influences the effect of aerodynamic drag forces exerted on it. These forces reduce the rate of acceleration to varying degrees such that after a period of time, the object is no longer accelerating, and has reached a state referred to as *terminal velocity*. Once terminal velocity is reached, the object would continue to fall at that velocity indefinitely. Total movement or displacement in this component, which may be considered the "Y" axis of a graph, is a function of velocity and time. Therefore, if the altitude of release is known, the time it takes the object to reach the ground may be calculated.

1.2.2 HORIZONTAL COMPONENT

When an object separates from a moving body, the object is moving in the same plane and velocity as the body from which it separated. Under theoretical conditions, the object would continue to move in the same plane and with the same velocity indefinitely. However, in reality, the same aerodynamic drag forces discussed above also begin to act on the object's horizontal movement. Once the velocity created by the moving body ceases, the object will begin to decelerate to terminal velocity. Here, too, once terminal velocity is reached, the object would continue to move at that velocity indefinitely. Total displacement in this component, which may be considered as the "X" axis of a graph, is also a function of velocity and time. Since the time the object is falling is known, then total distance along the aircraft's flight path from the point of release may also be calculated.

When both the vertical and horizontal components are integrated from a given release altitude to determine total time of flight, estimates may be calculated of the ground area along the track of the aircraft potentially exposed to impact from the object. This dimension is the length of the potential impact footprint on the ground.

1.2.3 LATERAL COMPONENT

Additional external environmental forces, such as wind, may also interact with the object during its free-fall. The amount of surface area of the object exposed to winds, as well as the direction of the winds relative to the object's movement through the air, will create accelerations that could move the object to the left or right of its horizontal flight path. Considering the same time factors discussed above, the lateral displacement of the object along what could be considered as the "Z" axis of a graph enable estimates to be made of how much to the left or right of the horizontal track the object may move. This dimension is the width of the potential impact footprint on the ground.

1.3 Trajectory Calculations

Three broad categories of calculations are used to describe the trajectory of the object. The first considers acceleration and deceleration to terminal velocity. The second considers accelerations due to other external forces, such as wind. The third considers the kinematics associated with the displacement of the object over time. Details are presented below.

1.3.1 TERMINAL VELOCITY

Terminal velocity (V_T) is calculated by:

$$V_T = \left[\frac{2}{p} \left(\frac{W}{A \times C_d} \right) \right]^{0.5}$$

Equation 1

Where: V_T = Terminal Velocity (in Feet / Second)
p = Nominal Air Density (2.378 X 10^{-3} lbs-sec^2 / ft^4
W = Weight (in Pounds)
A = Surface Area Facing the Airstream (in Ft^2)
C_d = Drag Coefficient

Once the terminal velocity associated with the object's specified characteristics is known, acceleration to terminal velocity over time is calculated by:

$$v = \left(\frac{m \times g}{b} \right) \times \left(1 - e^{\frac{-b \times T}{m}} \right)$$

Equation 2

Where: v = Velocity at a specific time (in Feet / Sec)
m = Mass (in Slugs)
g = Acceleration due to gravity (32.2 Feet / Sec^2)
b = Calculated constant due to Aerodynamic Drag. Derived from: (b = mg / Vt)
e = Natural Logarithm
T = Time Duration in Seconds

Integrating the time duration (T) in constant intervals provides incremental velocities at given points in time. These velocities may then be used to calculate displacement over time to determine the object's incremental location. This process is further addressed below.

Calculating data to describe the object's deceleration process (i.e., negative acceleration) is indirect. It is derived based on the basic relationship that:

$$F = m \times a$$

Equation 3a

Where: F = Force (in Pounds)
m = Mass
a = Acceleration (in Feet / Sec^2)

However, since acceleration is unknown, force may also be calculated from known values by:

$$F = (m \times g) - (b \times v)$$

Equation 3b

Where: F = Force
m = Mass
g = Acceleration due to Gravity
b = Calculated Constant
v = Velocity (in Feet / Sec)

Equation 3b calculates force using known values. Once force is calculated, it is substituted into Equation 3a and the equation is solved for acceleration. In this process, since it is deceleration that is being calculated, both force and acceleration will be negative values. By integrating these equations through specific time intervals, they provide data that enable calculations of the object's displacement in these time intervals.

1.3.2 LATERAL DISPLACEMENT

Lateral displacement is calculated by considering lateral acceleration. Engineering tables are available that provide levels of force per surface area (e.g., foot pounds per square foot). Once scaled to the applicable surface area involved, substitution into Equation 3a allows direct calculations of acceleration. Although aerodynamic drag could also be factored into these calculations, acceleration values are low, and the time durations involved indicate that very little variance would be introduced into the lateral movement assessment. Therefore, drag factors associated with lateral movement are not considered in this assessment.

1.3.3 KINEMATICS

All of the calculations discussed to this point define variables that enable the incremental calculation of displacement of the object from the point of release to points along the X, Y, and Z axes at specific points in time.

These calculations are supported by five variables. They are as follows:

a = Acceleration

v_f = Final Velocity

v_o = Original Velocity

t = Time

d = Displacement

Using these variables, the following five equations may be used to calculate required unknowns:

$$a = \frac{v_f - v_o}{t}$$

Equation 4

$$v_f = v_o + at$$

Equation 5

$$d = \frac{1}{2}\left(v_o + v_f\right) \times t$$

Equation 6

$$d = v_o t + \frac{1}{2} a t^2$$

Equation 7

$$v_f{}^2 = v_o{}^2 + 2ad$$

Equation 8

Collectively, these data show where the object would be expected to be located in the vertical, horizontal, and lateral components at any given point in time.

2.0 RISK SCENARIO

With these data, it is possible to develop scenarios using hypothetical data that provide a basis to assess the relative risk that may be associated with an object that has separated from an aircraft in flight. Data considered are purely hypothetical, and do not assess the probability of an object being dropped. There are no statistical data available to assess the probability of that event occurring. However, if it is assumed that it does occur, and a conservative probability is assigned to that occurrence, then scenarios may be developed to assess the relative risk to persons and property on the ground arising from such an occurrence.

Possible scenarios are infinitely variable. The following discussion is based on the factors specified. While different assumptions would produce different results, the levels of potential risk assessed would not be expected to vary significantly.

2.1 Assumptions

This scenario is based on the following assumptions:

- A bolt, 0.75 inches in diameter and 5 inches long weighing 8 ounces (0.5 pound) separates from an aircraft during straight and level flight.
- The aircraft is flying at 1,000 feet above ground level (AGL), at an airspeed of 500 knots (approximately 575 miles per hour).
- Winds are blowing directly perpendicular to the flight track of the aircraft at approximately 26 knots (30 miles per hour).

2.2 Ballistic Path of the Object

Once the bolt separates from the aircraft, it will follow a ballistic flight path, influenced by external environmental factors, until it impacts the ground. The path consists of vertical, horizontal, and lateral components. The vertical component involves its acceleration to terminal velocity due to gravity, but subject to aerodynamic drag. The horizontal component is based on its initial inertia (velocity), but subsequent deceleration to terminal velocity as a result of aerodynamic drag. The lateral component involves forces exerted by the cross wind.

For each of these components, the aerodynamic drag and associated acceleration / deceleration forces are a function of the surface area of the object interacting with the windstream. Since it is reasonable to assume that the object will be tumbling during its fall, it is impossible to precisely calculate the constant interaction of these factors. Therefore, for this scenario, calculations used will consider the range of effects that would result if either the maximum or minimum cross-section of the object were constantly exposed to the airstream. This considers both maximum and minimum aerodynamic drag forces, and bounds the path of the object to predict a risk-zone footprint on the ground.

Figure 2-1 illustrates the range of ground area along the aircraft's flight path potentially at risk under these conditions.

Under conditions of minimum aerodynamic drag (maximum displacement), calculations indicate that the object would travel approximately 6,133 feet along the aircraft's flight path before impacting the ground. Under conditions of maximum aerodynamic drag (minimum displacement), the distance would be approximately 3,862 feet.

Similar drag conditions, (i.e., whether the maximum or minimum cross-section of the object is exposed to the airstream) are also considered when estimating the object's potential lateral displacement (i.e., the amount of distance the wind would blow the object to the left or right of the aircraft's flight path). The range of these distances is illustrated in Figure 2-2.

Under conditions of maximum aerodynamic drag, the object is calculated to have a lateral dispersion of approximately 30 feet to the left or right of the aircraft's flight track, whereas under conditions of minimum aerodynamic drag, it could have a lateral dispersion of approximately 275 feet.

Figure 2-1
Ground Area Along Flight Track at Risk Under
Minimum and Maximum Aerodynamic Drag Forces

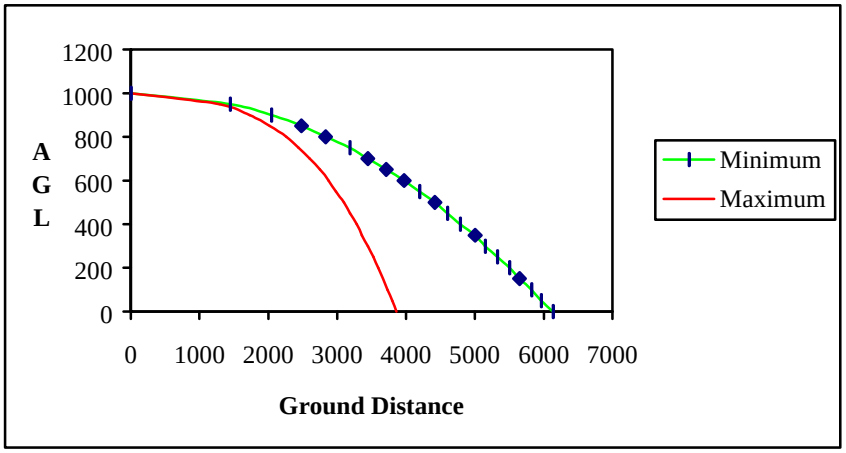
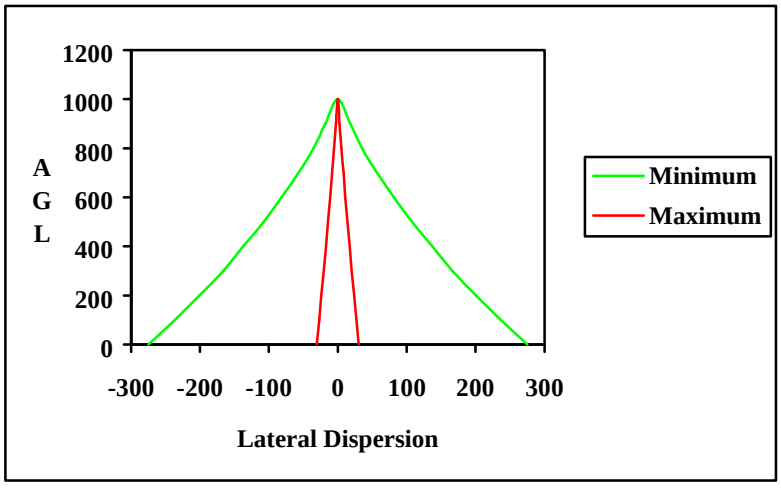


Figure 2-2
Lateral Dispersion Based On
Maximum and Minimum Aerodynamic Drag Forces



The combination of the range of horizontal and lateral dispersements form the basis of the risk assessment.

2.3 Risk Assessment

For this scenario, it is conservatively assumed that an object may separate from an aircraft once every 1,000 sorties. Thus, the probability of the event occurring is 0.001.

It is further assumed that for the object to cause physical harm to a person, it would have to impact in an approximate 1.5 square-foot area where the person was located. To damage a structure, it would have to impact the structure. For this scenario, a 1,200 square-foot structural footprint is assumed.

Calculations defining the ground hazard risk area indicate a track of ground approximately 2,275 feet long and 245 feet wide. This area is 557,375 square feet. Thus, the probability of the object impacting in any given 1.5 square foot area is 0.000002691 (2.691×10^{-6}), or in any 1,200 square foot area is 0.00215 (2.152×10^{-3}).

When the probability of the event even occurring is assumed to be 0.001, the probability of personal injury is assessed to be 0.000000003 (2.691×10^{-9}), and the probability of structure damage is 0.00000215 (2.153×10^{-6}). Viewed another way, these probabilities mean that the chance of personal injury is one chance in 371,609,067 and the chance of structure damage is one chance in 464,479.

Finally, it should be noted that these probability estimates do not even consider the probability of people or structures even being present in the area overflown. Therefore, in sparsely populated areas, these already minuscule risk levels would be even less.

Appendix K
INITIAL DISTRIBUTION OF THE DRAFT LEIS TO INTERESTED AGENCIES, ORGANIZATIONS, AND PERSONS

APPENDIX K

DISTRIBUTION OF THE LEIS (MARCH 1999) TO INTERESTED AGENCIES, ORGANIZATIONS, AND PERSONS

This appendix contains an initial LEIS distribution list of tribes, agencies, repositories, organizations, and persons who have been sent a Final LEIS (March 1999).

The list is organized into three groups. The first group contains names of American Indian tribes, government agencies and officials, and repositories; the second group consists of organizations; and the third group is comprised of private businesses and individuals. The list of repositories is also located in Volume 1, Chapter 10.0.

The Final LEIS is being sent to all agencies and individuals who either received a Draft LEIS or who requested a copy of the final. Everyone providing oral or written comments on the Draft LEIS was also sent a Final LEIS unless they specifically stated they did not want one.

AGENCIES/TRIBES/REPOSITORIES

Alamo Branch Library
Alamo, NV

Battle Mountain Band Council
Battle Mountain, NV

Beatty Library District
Beatty, NV

Board of County Commissioners
Goldfield, NV

Boulder City Library
Boulder City, NV

Carson City Library
Carson City, NV

Clark County Library
Las Vegas, NV

Community College of Southern Nevada - Library
North Las Vegas, NV

Henderson District Public Library
Henderson, NV

Indian Springs Library
Indian Springs, NV

Inner-Tribal Council of Nevada, Inc.
Reno, NV

Las Vegas Indian Center, Inc.
Las Vegas, NV

Las Vegas Valley Water District
Las Vegas, NV

Lincoln County Library - Pioche
Pioche, NV

Nevada Division of Emergency Management
Carson City, NV

North Las Vegas Library District
North Las Vegas, NV

Nye County Commissioners Office
Tonopah, NV

Pahrump Community Library
Pahrump, NV

Pahrump Town Board
Pahrump, NV

Reno-Sparks Indian Colony
Reno, NV

Tonopah Public Library
Tonopah, NV

U.S. Department of the Interior
Washington, D.C.

United States Bureau of Mines
Reno, NV

University of Nevada, Las Vegas
Las Vegas, NV

Washoe County Library
Reno, NV

White Pine County Public Library
Ely, NV

Robert Abbey
Bureau of Land Management
Reno, NV

Councilman Arnie Adamsen
City of Las Vegas
Las Vegas, NV

Gerald Allen
Nevada Indian Commission
Reno, NV

Brian Amme
BLM, Nevada State Office
Reno, NV

Geneal Anderson
Paiute Indian Tribes of Utah
Cedar City, UT

Gregory T. Anderson
Moapa Paiute Indian Tribe
Moapa, NV

Kenny Anderson
Las Vegas Paiute Tribe
Las Vegas, NV

Richard Arnold
Pahrump Paiute Tribe
Pahrump, NV

Dale W. Askew
Clark County
Las Vegas, NV

Chairwoman Yvonne Atkinson-Gates
Clark County Board of Commissioners
Las Vegas, NV

Darryl & Rose Marie Bahe
Benton Paiute Indian Tribe
Benton, CA

Catherine Barcomb
Commission for the Preservation of Wild Horses
Reno, NV

Patricia Battie
Clark County A-95 Clearinghouse Council
Las Vegas, NV

Gracie Begay
Wells Band
Wells, NV

Stewart Bell
Clark County
Las Vegas, NV

Raul Bennett
HQ ACC/DOR
Langley, VA

Dick Benoit
University of Nevada, Las Vegas
Las Vegas, NV

Richard Birger
U.S. Fish and Wildlife Service
Las Vegas, NV

Marie Boutte
University of Nevada, Reno
Reno, NV

Sam Bowler
Las Vegas Building Department
Las Vegas, NV

C. Boyle
Clark County Nuclear Waste Division
Las Vegas, NV

Carmen Bradley
Kaibab Band of Southern Paiutes
Pipe Springs, AZ

Les Bradshaw
Nye County
Pahrump, NV

Jacquelyne Brady
City of Laughlin
Laughlin, NV

Kevin Brady, Sr.
Yomba Shoshone Tribe
Austin, NV

Susan C. Brager
Clark County School District
Las Vegas, NV

Michael P. Branch
University of Nevada, Reno
Reno, NV

Felton Bricker, Sr.
Fort Mojave Tribe
Mojave, AZ

Kathie Brinkerhoff
University of Nevada, Reno Libraries
Reno, NV

Robert Broadbent
Clark County Aviation Department
Las Vegas, NV

Councilman Larry Brown
City of Las Vegas
Las Vegas, NV

Don Brown
City of North Las Vegas
North Las Vegas, NV

Gloria J. Brunette
Yerington Paiute Tribe
Yerington, NV

Frank Brusa
Las Vegas High School
Las Vegas, NV

Honorable Richard Bryan
Las Vegas, NV

Gary Bunney
Lake Mead Recreational Area
Boulder City, NV

Timothy J. Burns
City of Henderson
Henderson, NV

Mark Calhoun
Henderson Public Works
Henderson, NV

Wayne Cameron
White Pine County - Board of County Commissioners
Ely, NV

Chris Cannon
Las Vegas Library
Las Vegas, NV

The Honorable John Carpenter
Elko, NV

Eldene Cervantes
Paiute Indian Tribes of Utah
Santa Clara, UT

Jerry Charles
Ely Shoshone Tribe
Ely, NV

David Chavez
Chemehuevi Indian Tribe
Havasu Lake, CA

Lee Chavez
Bishop Paiute Indian Tribe
Bishop, CA

Col. Charles Chinnock
152 RG/CC
Reno, NV

Councilman Jack Clark
City of Henderson
Henderson, NV

Maj. Gen. Drennan A. Clark
State of Nevada
Carson City, NV

Donald Cloquet
Las Vegas Indian Center
Las Vegas, NV

Anita Collins
Walker River Tribal Council
Schurz, NV

Commissioner Bill Copeland
Nye County
Tonopah, NV

Betty Cornelius
Colorado River Indian Tribes
Parker, AZ

David Cowperthwaite
Environmental Commission
Carson City, NV

Dr. Brian Cram
Clark County School District
Las Vegas, NV

Peter Cummings
Department of Economics and Urban Development
Las Vegas, NV

Councilwoman Amanda Cypers
City of Henderson
Henderson, NV

Judge Steve Dahl
North Las Vegas District Court
North Las Vegas, NV

J. Damron
HQ, Training and Doctrine Command
Ft. Monroe, VA

Frankie Sue Del Papa
State of Nevada
Carson City, NV

Jeff Denison
Nevada Division of Environmental Protection
Carson City, NV

Tom Dill
Lincoln County
Pioche, NV

The Honorable Joseph Dini, Jr.
Yerington, NV

Dr. Gail Dixon
Eldorado High School
Las Vegas, NV

L.H. Dodgion
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Appendix L
PUBLIC LAW 99-606

PUBLIC LAW 99606 [H.R. 1790]; November 6,1986

WITHDRAWALS OF PUBLIC LANDS FOR MILITARY PURPOSES

An Act to withdraw certain public lands for military purposes, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

SECTION 1. WITHDRAWALS.

a. BRAVO-20 BOMBING RANGE.

1. Subject to valid existing rights and except as otherwise provided in this Act, the lands referred to in paragraph (2) of this subsection, and all other areas within the boundary of such lands as depicted on the map specified in such paragraph which may become subject to the operation of the public land laws, are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws). Such lands are reserved for use by the Secretary of the Navy for -

   A. testing and training for aerial bombing, missile firing, and tactical maneuvering and air support; and

   B. subject to the requirements of section 3(f), other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are the public lands comprising approximately 21,576.40 acres in Churchill County, Nevada, as generally depicted on the map entitled "Bravo-20 Bombing Range Withdrawal--Proposed", dated April 1986, and filed in accordance with section 2.

3. This section does not affect the withdrawals of July 2, 1902

   August 26, 1902 and August 4, 1904, under which the Bureau of Reclamation utilizes for flooding, overflow, and seepage purposes approximately 14,750 acres of the lands withdrawn and reserved by this subsection.

b. NELLIS AIR FORCE RANGE.

1. Subject to valid existing rights and except as otherwise provided in this Act, the public lands described in paragraph (2) of this subsection are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws). Such lands are reserved for use by the Secretary of the Air Force -

   A. as an armament and high hazard testing area;

   B. for training for aerial gunnery, rocketry, electronic warfare, and tactical

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maneuvering and air support; and

C. subject to the requirements of section 3(f), for other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are the lands comprising approximately 2,946,000 acres of land in Clark, Nye, and Lincoln Counties, Nevada, as generally depicted on the map entitled "Nellis Air Force Range Withdrawal - Proposed", dated January 1985, and filed in accordance with section 2.

c. BARRY M. GOLDWATER AIR FORCE RANGE

1. Subject to valid existing rights and except as otherwise provided in this Act, the lands described in paragraph (2) of this subsection are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws). Such lands are reserved for use by the Secretary of the Air Force for -

   A. an armament and high hazard testing area

   B. training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and

   C. subject to the requirements of section 3(f), other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are the lands comprising approximately 2,664,423 acres in Maricopa, Pima and Yuma Counties, Arizona, as generally depicted on the map entitled "Luke Air Force Range Withdrawal--Proposed", dated January 1985, and filed in accordance with section 2.

d. McGREGOR RANGE

1. Subject to valid existing rights and except as otherwise provided in this Act, the public lands described in paragraph (2) of this subsection are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws). Such lands are reserved for use by the Secretary of the Army -

   A. for training and weapons testing; and

   B. subject to the requirements of section 3(fl, for other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are the lands comprising approximately 608,384.87 acres in Otero County, New Mexico, as generally depicted on the map entitled "Mcgregor Range Withdrawal--Proposed", dated January 1985, and filed in accordance with section 2.

3. Any of the public lands withdrawn under paragraph (1) of this subsection which, as of the date of enactment of this Act, are managed pursuant to section 603 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1782) shall continue to be managed under that section until Congress determines otherwise.

e. FORT GREELY MANEUVER AREA AND FORT GREELY AIR DROP ZONE

1. Subject to valid existing rights and except as otherwise provided in this Act, the lands

described in paragraph (2) of this subsection are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws), under an Act entitled "An Act to provide for the admission of the State of Alaska into the Union", approved July 7, 1958 (48 U.S.C. note prec. 21), and under the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.). Such lands are reserved for use by the Secretary of the Army for -

A. military maneuvering, training, and equipment development and testing and

B. subject to the requirements of section 3(f), other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are -

A. the lands comprising approximately 571,995 acres in the Big Delta Area, Alaska, as generally depicted on the map entitled "Fort Greely Maneuver Area Withdrawal--Proposed', dated January 1985, and filed in accordance with section 2, and

B. the lands comprising approximately 61,590 acres in the Granite Creek Area, Alaska, as generally depicted on the map entitled "Fort Greely, Air Drop Zone Withdrawal--Proposed", dated January 1985, and filed in accordance with section 2.

f. FORT WAINWRIGHT MANEUVER AREA.

1. Subject to valid existing rights and except as otherwise provided in this Act, the public lands described in paragraph (2) of this subsection are hereby withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws), under an Act entitled "An Act to provide for the admission of the State of Alaska into the Union", approved July 7, 1958 (48 U.S.C. note prec. 21) and under the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.). Such lands are reserved for use by the Secretary of the Army for -

A. military maneuvering;

B. training for artillery firing, aerial gunnery, and infantry tactics; and

C. subject to the requirements of section 3(f), other defense related purposes consistent with the purposes specified in this paragraph.

2. The lands referred to in paragraph (1) of this subsection are the lands comprising approximately 247,951.67 acres of land in the Fourth Judicial District, Alaska, as generally depicted on the map entitled "Fort Wainwright Maneuver Area Withdrawal--Proposed', dated January 1985, and filed in accordance with section 2.

SEC. 2. MAPS AND LEGAL DESCRIPTIONS.

a. PUBLICATION AND FILING REQUIREMENT. - As soon as practicable after the date of enactment of this Act, the Secretary of the Interior shall -

1. publish in the Federal Register a notice containing the legal description of the lands withdrawn and reserved by this Act, and

2. file maps and the legal description of the lands withdrawn and reserved by this Act with the Committee on Energy and Natural Resources of the United States Senate and with the Committee on Interior and Insular Affairs of the United States House of Representatives.

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b. TECHNICAL CORRECTIONS. - Such maps and legal descriptions shall have the same force and effect as if they were included in this Act except that the Secretary of the Interior may correct clerical and typographical errors in such maps and legal descriptions.

c. AVAILABILITY FOR PUBLIC INSPECTION. - Copies of such maps and legal descriptions shall be available for public inspection in the offices of the Director and appropriate State Directors of the Bureau of Land Management, the office of the commander, Bravo-20 Bombing Range; the offices of the Director and appropriate Regional Directors of the United States Fish and Wildlife Service; the office of the commander, Nellis Air Force Base, the office of the commander, Barry M. Goldwater Air Force Base, the office of the commander, Mcgregor Range; the office of the installation commander, Fort Richardson, Alaska, the office of the commander, Marine Corps Air Station, Yuma, Arizona; and the office of the Secretary of Defense.

d. REIMBURSEMENT. - The Secretary of Defense shall reimburse the Secretary of the Interior for the cost of implementing this section.

SEC. 3. MANAGEMENT OF WITHDRAWN LANDS.

a. MANAGEMENT BY THE SECRETARY OF THE INTERIOR.

1. **During the period of the withdrawal, the Secretary of the Interior shall manage the lands withdrawn under section 1 (except those lands within a unit of the National Wildlife Refuge System) pursuant to the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) and other applicable law, including the Recreation Use of Wildlife Areas Act of 1962 (16 U.S.C. 460k et seq.), and this Act. Lands within the Desert National Wildlife Range** and the Cabeza Prieta National Wildlife Refuge **shall be managed pursuant to the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.) and other applicable law. No provision of this Act, except sections 4, 11, and 12, shall apply to the management of the Desert National Wildlife Range** or the Cabeza Prieta National Wildlife Refuge.

2. **To the extent consistent with applicable law and Executive orders, the lands withdrawn under section 1 may be managed in a manner permitting -**

   A. the continuation of grazing pursuant to applicable law ant Executive orders where permitted on the date of enactment of this Act;

   B. protection of wildlife and wildlife habitat;

   C. control of predatory and other animals;

   D. recreation; and

   E. the prevention and appropriate suppression of brush and range fires resulting from nonmilitary activities.

3. **(A) All nonmilitary use of such lands, other than the uses described in paragraph (2), shall be subject to such conditions and restrictions as may be necessary to permit the military use of such lands for the purposes specified in or authorized pursuant to this Act.**

   (B) The Secretary of the Interior may issue any lease, easement, right of way, or other authorization with respect to the nonmilitary we of such land only with the concurrence of the Secretary of the military department concerned.

b. CLOSURE TO PUBLIC.

1. **If the Secretary of the military department concerned determines that military operations, public safety, or national security require the closure to public use of any road, trail, or other portion of the lands withdrawn by this Act, the Secretary may take such action as the Secretary determines necessary or desirable to effect and maintain such closure.**

2. **Any such closure shall be limited to the minimum areas and periods which the Secretary of the military department concerned determines are required to carry out this subsection.**

3. **Before and during any closure under this subsection, the Secretary of the military department concerned shall -**

   A. **keep appropriate warning notices posted and**

   B. **take appropriate steps to notify the public concerning such closures.**

c. MANAGEMENT PLAN. - The Secretary of the Interior (after consultation with the Secretary of the military department concerned) shall develop a plan for the management of each area withdrawn under section 1 during the period of such withdrawal. Each plan shall -

1. **be consistent with applicable law;**

2. **be subject to conditions and restrictions specified in subsection (a)(3) of this section;**

3. **include such provisions as may be necessary for proper management and protection of the resources and values of such areas; and**

4. **be developed not later than three years after the date of enactment of this Act.**

d. BRUSH AND RANGE FIRES. - The Secretary of the military department concerned shall take necessary precautions to prevent and suppress brush and range fires occurring within and outside the lands withdrawn under section 1 as a result of military activities and may seek assistance from the Bureau of Land Management in the suppression of such fires. The memorandum of understanding required by subsection (e) shall provide for Bureau of Land Management assistance in the suppression of such fires, and for a transfer of funds from the Department of the Navy, Army, or Air Force, as appropriate, to the Bureau of Land Management as compensation for such assistance.

e. MEMORANDUM OF UNDERSTANDING.

1. **The Secretary of the Interior and the Secretary of the military department concerned shall (with respect to each land withdrawal under section (1) enter into a memorandum of understanding to implement the management plan developed under subsection (c). Any such memorandum of understanding shall provide that the Director of the Bureau of Land Management shall provide assistance in the suppression of fires resulting from the military use of lands withdrawn under section 1 if requested by the Secretary of the military department concerned.**

2. **The duration of any such memorandum shall be the same as the period of the withdrawal of the lands under section 1.**

f. ADDITIONAL MILITARY USES.

1. **Lands withdrawn by section 1 (except those within the Desert National Wildlife Range** or within the Cabeza Prieta National Wildlife Refuge) **may be used for defense related uses other than those specified in such section. The Secretary of Defense shall promptly notify the Secretary of the Interior in the event that the lands withdrawn by this Act will be used for defense related purposes other than those specified in section 1. Such notification shall indicate the additional use or uses involved, the proposed duration of such uses, and the extent to which such additional military uses of the withdrawn lands will require that additional or more stringent conditions or restrictions be imposed on otherwise permitted nonmilitary uses of the withdrawn land or portions thereof.**

SEC. 4. SPECIAL WILDLIFE RULES.

a. **NELLIS AIR FORCE RANGE.**

1. **Neither the withdrawal under section l(b) nor any other provision of this Act shall be construed to amend--**

   A. **the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.) or any other law related to management of the National Wildlife Refuge System; or**

   B. **any Executive order or public land order in effect on the date of enactment of this Act with respect to the Desert National Wildlife Refuge.**

2. **Neither the withdrawal under section 1(b) nor any other provision of this Act shall be construed to amend any memorandum of understanding between the Secretary of the Interior and the secretary of the Air Force regarding the administration and joint use of a portion of the Desert National Wildlife Range. The provisions of the memorandum of understanding between the Secretary of the Interior and the Department of the Air Force regarding Air Force operations on the Desert National Wildlife Range in effect on March 15, 1986, shall not be amended sooner than 90 days after the Secretary of the Interior has notified the Committee on Interior and Insular Affairs of the House of Representatives, the Committee on Energy and Natural Resources of the Senate, the Committees on Armed Services of the Senate and the House of Representatives, the Committee on Merchant Marine and Fisheries of the House of Representatives, and the Committee on Environment and Public Works of the Senate of any proposed amendments to such provisions.**

b. BARRY M. GOLDWATER AIR FORCE RANGE.

1. Neither the withdrawal under section 1(c) nor any other provision of this Act shall be construed to amend -

   A. the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.) or any other law related to management of the National Wildlife Refuge System; or

   B. any Executive order or public land order in effect on the date of enactment of this Act with respect to the Cabeza Prieta National Wildlife Refuge.

2. Neither the withdrawal under section 1(c) nor any other provision of this Act shall be construed to amend any memorandum of understanding between the Secretary of the Interior and the Secretary of the Air Force regarding the administration and joint use of a portion of the Cabeza Prieta National Wildlife Refuge. The provisions of the memorandum of understanding between the Secretary of the Interior and the Department of the Air Force regarding Air Force operations on the Cabeza Prieta National Wildlife Refuge in effect on

March 24, 1975, shall not be amended sooner than 90 days after the Secretary of the Interior has notified the Committee on Interior and Insular Affairs of the House of Representatives, the Committee on Energy and Natural Resources of the Senate, the Committees on Armed Services of the Senate and the House of Representatives, the Committee on Merchant Marine and Fisheries of the House of Representatives, and the Committee on Environment and Public Works of the Senate of any proposed amendments to such provisions.

SEC. 5. DURATION OF WITHDRAWALS.

a. DURATION. - The withdrawal and reservation established by this Act shall terminate 15 years after the date of enactment of this Act.

b. DRAFT ENVIRONMENTAL IMPACT STATEMENT.

1. No later than 12 years after the date of enactment of this Act, the Secretary of the military department concerned shall publish a draft environmental impact statement concerning continued or renewed withdrawal of any portion of the lands withdrawn by this Act for which that Secretary intends to seek such continued or renewed withdrawal. Such draft environmental impact statement shall be consistent with the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) applicable to such a draft environmental impact statement. Prior to the termination date specified in subsection (a), the Secretary of the military department concerned shall hold a public hearing on any draft environmental impact statement published pursuant to this subsection. Such hearing shall be held in the affected State or States in order to receive public comments on the alternatives and other matters included in such draft environmental impact statement.

2.

A. For purposes of such draft environmental impact statement published by the Secretary of the Navy, the term "lands withdrawn by this Act" shall be deemed to include lands withdrawn by public land orders 275, 788, 898, and 2635 and lands proposed for withdrawal as specified in the draft environmental impact statement for the proposed master land withdrawal, Naval Air Station, Fallon, Nevada.

B. For purposes of this subsection, lands withdrawn by section l(b) shall be deemed to include lands withdrawn by Public Law 9848a.

c. EXTENSIONS OR RENEWALS. - The withdrawals established by this Act may not be extended or renewed except by an Act or joint resolution.

SEC. 6. NEVADA REPORT.

a. SPECIAL NEVADA REPORT. - No later than five years after the date of enactment of this Act, the Secretary of the Air Force, the Secretary of the Navy, and the Secretary of the Interior shall submit to Congress a joint report. In addition to the other matters required by this section, the report shall include an analysis and an evaluation of the effects on public health and safety throughout Nevada of -

1. the operation of aircraft at subsonic and supersonic speeds;

2. the use of aerial and other gunnery, rockets, and missiles; and

3. the uses specified in section 1.

b. EVALUATION OF CUMULATIVE EFFECTS OF CONTINUED OR RENEWED WITHDRAWAL. - Each of the military departments concerned and the Secretary of the

Interior shall, in the report required by this section, evaluate the cumulative effects of continued or renewed withdrawal for military purposes of the military department concerned of some or all of the lands withdrawn by sections 1(a) and 1(b) on the environment and population of Nevada. In performing this evaluation, there shall be considered -

1. **the actual and proposed withdrawal for military and related purposes of other lands in Nevada, including (but not limited to)--**

   A. **lands withdrawn by sections 1(a) and 1(b) of this Act and by Public Law 98485 (98 Stat. 2261);**

   B. **lands withdrawn by Public Land Orders 275, 788, 898, and 2635**

   C. **lands proposed for withdrawal as specified in the draft environmental impact statement for the proposed master land withdrawal, Naval Air Station, Fallon, Nevada; and**

   D. **lands withdrawn or being considered for withdrawal for use by the Department of Energy; and**

2. **the cumulative impacts on public and private property in Nevada and on the fish and wildlife, cultural, historic scientific, recreational, wilderness, and other values of the public lands of Nevada resulting from military and defense related uses of the**

   lands withdrawn by sections 1(a) and 1(b) and the other lands described in paragraph (1) of this subsection.

c. **MITIGATION MEASURES. - The report required by this subsection shall include an analysis and an evaluation of possible measures to mitigate the cumulative effect of the withdrawal of public lands in Nevada for military and defense related purposes, and of use of the airspaces over public lands in Nevada for such purposes, on people and property in Nevada and the fish and wildlife, cultural, historic, scientific, wilderness, and other resources and values of the public lands in Nevada (including recreation, mineral development, and agriculture).**

SEC. 7. ONGOING DECONTAMINATION.

a. **PROGRAM. - Throughout the duration of the withdrawals made by this Act, the Secretary of the military department concerned, to the extent funds are made available, shall maintain a program of decontamination of lands withdrawn by this Act at least at the level of cleanup achieved on such lands in fiscal year 1986.**

b. **REPORTS. - At the same time as the President transmits to the Congress the President's proposed budget for the first fiscal year beginning after the date of enactment of this Act and for each subsequent fiscal year, each such Secretary shall transmit to the Committees on Appropriations, Armed Services, and Energy and Natural Resources of the Senate and to the Committees on Appropriations, Armed Services, and Interior and Insular Affairs of the House of Representatives a description of the decontamination efforts undertaken during the previous fiscal year on such lands and the decontamination activities proposed for such lands during the next fiscal year including:**

   1. **amounts appropriated and obligated or expended for decontamination of such lands**

   2. **the methods used to decontaminate such lands;**

   3. **amount and types of contaminants removed from such lands**

4. estimated types and amounts of residual contamination on such lands; and

5. an estimate of the costs for full decontamination of such lands and the estimate of the time to complete such decontamination.

SEC. 8. REQUIREMENT FOR RENEWAL.

a. NOTICE AND FILING.

1. No later than three years prior to the termination of the withdrawal and reservation established by this Act, the Secretary of the military department concerned shall advise the Secretary of the Interior as to whether or not the Secretary of the military department concerned will have a continuing military need for any of the lands withdrawn under section 1 after the termination date of such withdrawal and reservation.

2. If the Secretary of the military department concerned concludes that there will be a continuing military need for any of such lands after the termination date, that Secretary shall file an application for extension of the withdrawal and reservation of such needed lands in accordance with the regulations and procedures of the Department of the Interior applicable to the extension of withdrawals of lands for military uses.

3. If, during the period of withdrawal and reservation, the Secretary of the military department concerned decides to relinquish all or any of the lands withdrawn and reserved by this Act, such Secretary shall file a notice of intention to relinquish with the Secretary of the Interior.

(b) CONTAMINATION.

1. Before transmitting a notice of intention to relinquish pursuant to subsection (a), the Secretary of Defense, acting through the military department concerned, shall prepare a written determination concerning whether and to what extent the lands that are to be relinquished are contaminated with explosive, toxic, or other hazardous materials.

2. A copy of such determination shall be transmitted with the notice of intention to relinquish.

3. Copies of both the notice of intention to relinquish and the determination concerning the contaminated state of the lands shall be published in the Federal Register by the Secretary of the Interior.

b. DECONTAMINATION. - If any land which is the subject of a notice of intention to relinquish pursuant to subsection (a) is contaminated, and the Secretary of the Interior, in consultation with the Secretary of the military department concerned, determines that decontamination is practicable and economically feasible (taking into consideration the potential future use and value of the land) and that upon decontamination, the land could be opened to operation of some or all of the public land laws, including the mining laws, the Secretary of the military department concerned shall decontaminate the land to the extent that funds are appropriated for such purpose.

c. ALTERNATIVES. - If the Secretary of the Interior, after consultation with the Secretary of the military department concerned, concludes that decontamination of any land which is the subject of a notice of intention to relinquish pursuant to subsection (a) is not practicable or economically feasible, or that the land cannot be decontaminated sufficiently to be opened to operation of some or all of the public land laws, or if Congress does not appropriate a

sufficient amount of funds for the decontamination of such land, the Secretary of the Interior shall not be required to accept the land proposed for relinquishment.

d. STATUS OF CONTAMINATED LANDS.- If, because of their contaminated state, the Secretary of the Interior declines to accept jurisdiction over lands withdrawn by this Act which have been proposed for relinquishment, or if at the expiration of the withdrawal made by this Act the Secretary of the Interior determines that some of the lands withdrawn by this Act are contaminated to an extent which prevents opening such contaminated lands to operation of the public land laws -

1. **the Secretary of the military department concerned shall take appropriate steps to warn the public of the contaminated state of such lands and any risks associated with entry onto such lands**

2. **after the expiration of the withdrawal, the Secretary of the military department concerned shall undertake no activities on such lands except in connection with decontamination of such lands, and**

3. **the Secretary of the military department concerned shall report to the Secretary of the Interior and to the Congress concerning the status of such lands and all actions taken in furtherance of this subsection.**

e. REVOCATION AUTHORITY. - Not withstanding any other provisions of law, the Secretary of the Interior, upon deciding that it is in the public interest to accept jurisdiction over lands proposed for relinquishment pursuant to subsection (a), is authorized to revoke the withdrawal and reservation established by this Act as it applies to such lands. Should the decision be made to revoke the withdrawal and reservation, the Secretary of the Interior shall publish in the Federal Register an appropriate order which shall -

1. **terminate the withdrawal and reservation;**

2. **constitute official acceptance of full jurisdiction over the lands by the Secretary of the Interior and**

3. **state the date upon which the lands will be opened to the operation of some or all of the public lands laws, including the mining laws.**

SEC. 9. DELEGABILITY.

a. DEFENSE. - The functions of the Secretary of Defense or of a military department under this title may be delegated.

b. INTERIOR. - The functions of the Secretary of the Interior under this title may be delegated, except that an order described in section 7(f) may be approved and signed only by the Secretary of the Interior, the Under Secretary of the Interior, or an Assistant Secretary of the Department of the Interior.

SEC. 10. WATER RIGHTS.

Nothing in this Act shall be construed to establish a reservation to the United States with respect to any water or water right on the lands described in section 1 of this Act. No provision of this Act shall be construed as authorizing the appropriation of water on lands described in section 1 of this Act by the United States after the date of enactment of this Act except in accordance with the law of the relevant State in which lands described in section 1 are located. This section shall not be construed to affect water rights acquired by the United States before the date of enactment of this Act.

SEC. 11. HUNTING, FISHING. AND TRAPPING.

All hunting, fishing, and trapping on the lands withdrawn by this Act shall be conducted in accordance with the provisions of section 2671 of title 10, United States Code, except that hunting, fishing, and trapping within the Desert National Wildlife Range and the Cabeza Prieta National Wildlife Refuge **shall be conducted in accordance with the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.), the Recreation Use of Wildlife Areas Act of 1969 (16 U.S.C. 460k et seq), and other laws applicable to the National Wildlife Refuge System.**

SEC. 12. MINING AND MINERAL LEASING.

a. **DETERMINATION OF LANDS SUITABLE FOR OPENING. - As soon as possible after the enactment of this Act and at least every five years thereafter, the Secretary of the Interior shall determine, with the concurrence of the Secretary of the military department concerned, which public and acquired lands (except as provided in this subsection) described in subsections (a), (b), (d), (e), and (fl of section 1 of this Act the Secretary of the Interior considers suitable for opening to the operation of the Mining Law of 1872, the Mineral Lands Leasing Act of 1920, as amended, the Mineral Leasing Act for Acquired Lands of 1947, the Geothermal Steam Act of 1970, or an) one or more of such Acts. The Secretary of the Interior shall publish a notice in the Federal Register listing the lands determined suit able pursuant to this section and specifying the opening date, except that lands contained within the Desert National Wildlife Range in Nevada** or within the Cabeza Prieta National Wildlife Refuge in Arizona **shall not be determined to be suitable for opening pursuant to this section.**

b. **OPENING LANDS. - On the day specified by the Secretary of the Interior in a notice published in the Federal Register pursuant to subsection (a), the land identified under subsection (a) as suitable for opening to the operation of one or more of the laws specified in subsection (a) shall automatically be open to the operation of such laws without the necessity for further action by either the Secretary or the Congress.**

c. **EXCEPTION FOR COMMON VARIETIES. - No deposit of minerals or materials of the types identified by section 3 of the Act of July 23. 19.;5 (69 Stat. 367), whether or not included in the term "common varieties" in that Act, shall be subject to location under the Mining Law of 1872 on lands described in section 1.**

d. **REGULATIONS. - The Secretary of the Interior, with the advice and concurrence of the Secretary of the military department concerned shall promulgate such regulations to implement this section as may be necessary to assure safe, uninterrupted, and unimpeded use of the lands described in section 1 for military purposes. Such regulations shall also contain guidelines to assist mining claimants in determining how much, if any, of the surface of any lands opened pursuant to this section may be used for purposes incident to mining.**

e. **CLOSURE OF MINING LANDS.- In the event of a national emergency or for purposes of national defense or security, the Secretary of the Interior, at the request of the Secretary of the military department concerned, shall close any lands that have been opened to mining or to mineral or geothermal leasing pursuant to this section.**

f. **LAWS GOVERNING MINING ON LANDS WITHDRAWN UNDER THIS ACT.**

   1. **Except as otherwise provided in this Act, mining claims located pursuant to this Act shall be subject tO the provisions of the mining laws. In the event of a conflict between those laws and this Act, this Act shall prevail.**

   2. **All mining claims located under the terms of this Act shall be subject to the provisions of the Federal Land Policy and Management Act of 1976(43 U.S.C. 1701 et seq.).**

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g. PATENTS.

1. Patents issued pursuant to this Act for locatable minerals shall convey title to locatable minerals only, together with the right to use so much of the surface as may be necessary for purposes incident to mining under the guidelines for such use established by the Secretary of the Interior by regulation.

2. All such patents shall contain a reservation to the United States of the surface of all lands patented and of all nonlocatable minerals on those lands.

3. For the purposes of this section, all minerals subject to location under the Mining Law of 1872 are referred to as "locatable minerals".

h. REVOCATlON.--Notwithstanding any other provision of law, the Secretary of the Interior, if the Secretary determines it necessary and appropriate for the purpose of consummating an exchange of lands or interests therein under applicable law, is hereby authorized and directed to revoke the Small Tract Act Classification S.T.049794 in Clark County, Nevada.

SEC. 13. IMMUNITY OF UNITED STATES.

The United States and all departments or agencies thereof shall be held harmless and shall not be liable for any injuries or damages to persons or property suffered in the course of any mining or mineral or geothermal leasing activity conducted on lands described in section 1 of this Act.

SEC. 14. SHORT TITLE.

Sections 1 through 15 of this Act may be cited as the "Military Lands Withdrawal Act of 1986".

SEC. 15. REDESIGNATION.

The Luke Air Force Range in Arizona is hereby redesignated as the "Barry M. Goldwater Air Force Range". Any reference in any law, regulation, document, record, map, or other paper of the United States to the Luke Air Force Range shall be deemed to be a reference to the "Barry M. Goldwater Air Force Range".

SEC. 16. BOUNDARY ADJUSTMENT TO CUYAHOGA VALLEY NATIONAL RECREATION AREA.

Section 2 of the Act entitled "An Act to provide for the establishment of the Cuyahoga Valley National Recreational Recreation Area", approved December 27, 1974 (16 U.S.C. 460ff et seq.), is amended as follows:

1. In subsection (a), strike out "numbered 65590,001A and dated May 1978" and insert "numbered 64480,054 and dated July 1986".

2. At the end of subsection (a), insert the following:

   "The recreation area shall also comprise any lands designated as 'City of Akron Lands' on the map referred to in the first sentence which are offered as donations to the Department of the Interior or which become privately owned. The Secretary shall revise such map to depict such lands as part of the recreation area.".

3. In subsection (b), after the first sentence, insert the following:

   "The Secretary may not acquire fee title to any lands included within the recreation area in 1986 which are designated on the map referred to in subsection (a) as 'Scenic Easement Acquisition

Areas'. The Secretary may acquire only scenic easements in such designated lands. Unless consented to by the owner from which the easement is acquired, any such scenic easement may not prohibit any activity, the subdivision of any land, or the construction of any building or other facility if such activity, subdivision, or construction would have been permitted under laws and ordinances of the unit of local government in which such land was located on April 1, 1986, as such laws and ordinances were in effect on such date".

Approved November 6, 1986.
